Volume 83
Number 14

IRON TRADE REVIEW

Cleveland, O.
Oct. 4, 1928

Industrial Spain Enriched with Mineral Treasures

By Vincent Delport

European Manager, Iron Trade Review

TWO events of importance this year direct attention to the industrial progress of Spain. One was the European foundry congress and exhibition, in Barcelona in April; the other was the meeting of the British Iron and Steel institute held in Bilbao at the end of September. Both were attended by a large number of delegates from the four corners of Europe.

In view of this interest, a comprehensive survey of Spain's metallurgical status is deemed timely. Two articles, of which this is the first, will be presented; the second to follow in the next issue of IRON TRADE REVIEW. *The information was obtained from official sources during the writer's recent visits to that country. Details respecting Spain's resources of raw materials are given in this first article. The second will feature iron and steel manufacture.*

SPAIN is a country whose natural attractions are difficult to resist. It is a country of contrasts; as seen, for instance, in the plain of la Huerta, province of Valencia, where the richest orange plantations thrive between the blue Mediterranean and rugged mountains; large progressive cities such as Barcelona and Madrid, and small towns such as Sagunto or Avila whose stones are baked by the sun and whose very names bring one back to the period of Roman occupation. There is contrast between the apparent poverty of its tumble-down villages, the barrenness of miles upon miles of landscape such as that which stretches outward from Madrid, and the well-nigh inexhaustible richness of the subsoil. A clump of palm trees growing in the stockyards of the Sagunto steelworks, themselves surrounded by orange groves, is a typical example of

Continuous mill at the Sestao Works of Fabrika de Altos Hornos de Vizcaya, Spain

the impression received by the visitor. The aridity of considerable areas of the country might lead one to think that this land of art treasures and striking landscapes has not otherwise been favored by nature. However, Spain's wealth lies beneath the surface. Coal, copper, iron, lead and zinc ores are among the principal minerals exploited. Concessions are owned and worked by concerns of world-wide fame, and foreign capital has played a great part in their development. The extraction of the ores and their conversion into finished products are the mainsprings of industrial Spain and have necessitated the development of modern ports at Barcelona, Bilbao, Santander and Huelva. Metalworking is one of the oldest industries, and the finest examples of forging and tempering can be seen at the Armorial in Madrid, while at Toledo metals have been worked since the Dark Ages.

The total value of Spain's mineral production in 1926 was estimated at 475,598,411 pesetas ($79,266,462), against 498,443,427 pesetas ($83,073,905) in 1925. The value at the works of the output of those industries that transform the raw material into its next stage, was estimated at 918,979,850 pesetas ($153,163,310) in 1926, compared with 896,020,150 pesetas ($149,336,692) in 1925. The number of workers employed in the mines and metallurgical works, in 1926 was 165,397 compared with 166,419 in 1925.

Spain's iron and steel industry ranks second in value to its coal mining. Third in importance is the lead industry. In 1926 the output of pig iron which was not transformed into steel was valued at 10,223,679 pesetas ($1,703,947) and the output of steel ingots 165,172,415 pesetas ($27,528,736). With the addition of ferromanganese, ferrosilicon, and puddled iron, the aggregate value of "raw" iron and steel was estimated at 178,254,811 pesetas ($29,709,135), or nearly 20 per cent of the total value of products obtained from minerals. Practically all of the iron and steel output is fabricated and marketed in the country itself.

Spain's coal production is plentiful, but not sufficient for its own needs. Imports in 1925 amounted to 22 per cent of its consumption; in 1926 the proportion of imports dropped to 13 per cent, increasing substantially in 1927. Its exports of coal are negligible. In 1925 the industry was subsidized, first by returns from the duty on imported coal, and then by government grants. Early in 1926 the National Fuel council was formed and imports were restricted. Recently the council and the direction of Mines and Metallurgical Industries were merged into the General Direction of Mines and Fuel, depending on the ministry of Fomento, the office concerned with industry and commerce.

The new council has fixed the proportions of foreign coal that the various consuming industries are authorized to import. Works depending upon the state or municipalities must use 100 per cent domestic coal. The iron and steel works, however, are authorized to import 50 per cent of their requirements, except those works which in the past three years have consumed less than that proportion of foreign coal, in which case they must restrict their imports to that same proportion. The railroads and other industries can import 10 to 20 per cent of their requirements. Great Britain is the most important supplier of foreign coal.

Total reserves of coal in Spain are estimated at 8,000,000,000-9,000,000,000 tons. The principal producing district is Oviedo, in the north of Spain, which in 1927 yielded 3,887,-

Table I

Spain's Ore Production

(Metric tons)

	Iron ore	Iron pyrites	Manganiferous iron ore	Manganese
1919	4,640,061	431,188	.....	66,685
1920	4,767,693	704,153	2,100	21,256
1921	2,602,369	603,394	.....	20,098
1922	2,771,888	468,080	.....	25,455
1923	3,453,233	488,987	.....	28,635
1924	4,612,817	597,132	11,975	20,840
1925	4,442,872	5,040	14,159	36,072
1926	3,181,589	4,398	9,032	44,947
1927	4,906,300	.....	.....	37,159

Table II

Spain's Coal Production

(Metric tons)

	Bituminous	Anthracite	Lignite
1919	5,304,866	398,771	593,872
1920	4,928,989	491,715	552,425
1921	4,719,638	292,591	408,684
1922	4,179,533	256,310	329,680
1923	5,672,377	299,069	394,268
1924	5,811,396	316,190	411,773
1925	5,801,304	316,038	402,690
1926	6,133,230	402,857	399,830
1927	5,626,934	409,040	423,757

Table III

Coke Output, Imports

(Metric tons)

	Production	Imports	Imports per cent of production
1919	424,867	.....	.....
1920	280,717	37,133	13.2
1921	446,087	110,645	26.2
1922	383,151	69,900	18.3
1923	743,590	50,213	6.7
1924	848,273	96,366	11.4
1925	877,918	126,015	14.4
1926	832,210	88,601	10.6
1927	845,605	179,000	21.2

COAL, coke, iron ore and water unite at this harbor and works of Altos Hornos de Vizcaya, one of Spain's leading iron and steel centers. Steel was made in Spain in the Dark Ages. Below is pictured the ruins of one of the first smelting plants in that country.

726 metric tons of soft coal, or 60.10 per cent of the total production, the figures for 1926 being 4,195,870 metric tons and 68 per cent, respectively. Next come the provinces of Ciudad Real with 458,411 tons and 588,023 tons, respectively; Leon with 598,108 tons and 587,145 tons; and Cordoba with 260,500 tons and 310,365 tons. The output of the province of Ciudad Real has nearly doubled in the past three years, owing to the development of mechanical methods of extraction. The aggregate number of workmen employed in the bituminous coal mines of Spain in 1926 was 43,439, of which 30,415 worked underground. The annual output per underground worker in 1926 was 201.6 tons, against 190.7 tons in 1925. The average value per ton at the mine in 1926 was 32.40 pesetas ($5.40). The value was as low as 20 pesetas ($3.33) in the province of Badayoz, and as high as 43.76 pesetas ($7.30) in the province of Sevilla.

Anthracite is extracted in the provinces of Cordoba, Leon, and Palencia. In 1926, 2988 workers were employed at the mines, and the average value per ton extracted was 45.27 pesetas ($7.54). In the province of Sevilla some rich deposits have been prospected by the M.Z.A. railroad company, while the Penarroya company is exploiting the northern portion of the Belmez basin.

Spain depends to a comparatively small extent on foreign supplies of coke. The production figures in Table III include all kinds of coke, the output for 1927 being estimated at 845,605 metric tons. In 1926 coke was produced in 1159 ovens divided among 47 works. Of these ovens 401 were of the Carves type; 184 were of the Semet-Solvay type and 100 of the Lecocq type. The cokeries employed 1808 workers, and the value of the output at the ovens was estimated at 64,931,054 pesetas ($10,821,842). In 1926, 1,171,624 tons of coal was used to produce 832,210 tons of coke. More than 85 per cent of the output is by-product coke.

Practically all the metallurgical coke is manufactured at the iron and steel works. The principal center of production is the province of Vizcaya, whose output in 1926 was 326,434 tons. The steelworks of Vizcaya produced 310,494 tons. The output of the province of Oviedo was 163,539 tons, of which 130,322 tons was produced at the steelworks of Duro-Felguera, Fabrica de Mieres and Moreda y Gijon. In Oviedo the average value of a ton of coke at the ovens was 51.98 pesetas ($8.66). The output of the province of Valencia was 99,860 tons, of which 92,536 tons was manufactured at the works of Compania Siderurgica del Mediterraneo, which commenced operations in the year 1923.

Iron ore constitutes one of the principal riches of Spain. The

Table IV

Exports of Iron Ore from Spain

(Metric tons)

	To Great Britain	Holland	France	Germany	United States	Total, including other countries
1920	3,902,702	413,662	125,342	74,856	62,522	4,630,662
1921	874,157	604,659	142,394	162,525	2,765	1,824,754
1922	.....	.....	.....	.....	.....	2,752,027
1923	.....	.....	.....	.....	.....	3,370,520
1924	439,032	578,340	139,455	384,675	85,979	1,680,398
1925	1,995,358	776,154	145,555	449,104	123,423	3,617,751
1926	951,114	446,265	131,274	219,324	74,814	1,856,975
1927	.....	.....	.....	.....	.....	4,750,000

These figures are exclusive of iron pyrites. Detailed figures for 1922, 1923 and 1927 not available.

actual value of the ore extracted at the mines ranks fourth, after coal, lead ore, and copper pyrites, in the category of minerals. The value of iron ore exported in 1926 was estimated at 35,282,525 pesetas ($5,880,421). Furthermore, the Spanish ore mines have enabled a national iron and steel industry to develop to a considerable extent.

Spain's ore deposits are of good quality. On Dec. 31, 1926, the number of concessions being exploited was 231, covering an area of 6255 hectares (15,450 acres), and 8708 concessions were not exploited, covering an area of 268,678 hectares (663,650 acres). The reserves of iron ore in Spain have been estimated in recent years at 1,116,000,000 tons definite and 273,000,000 additional tons as probable. The principal producing district is that of Vizcaya, yielding chiefly rubio and carbonates. Manganiferous iron ore is found in the province of Oviedo. By far the greatest proportion of the iron ore produced, varying from 60 to 85 per cent according to trade conditions, is exported, principally to Great Britain.

Although Vizcaya still is the province from which the most ore is obtained, 45 per cent of the total in 1926, the proportion of high-grade ore in that basin has substantially diminished. As far back as 1922 it was estimated that 170,000,000 tons of high-grade ore had been extracted from the district and that there was left 80,000,000 tons of reserves of such ore. The output of Santander also tends to decrease. There are, however, considerable reserves in the provinces of Almeria, Granada, Guadalajara, Teruel and Oviedo. The districts of Almeria and Teruel already are well exploited, the first-named having yielded 571,765 tons in 1927, as against 562,337 tons in 1926, and the second 836,106 tons, as compared with 217,303 tons. Operations in other basins are handicapped at present by the lack of adequate means of transportation.

It is generally considered that the province of Oviedo will be of primary importance in the future, owing to its large reserves, its position near the coast, and its proximity to important iron and steel works. For the present this basin is mined only for local needs, and its output hardly exceeds 50,000 tons annually. The mines in this basin contain carbonates, hematite, and magnetite, in addition to manganiferous ores. According to an estimate made in 1922, the reserves of this district exceed 254,000,000 tons, with an average iron content not inferior to 40 per

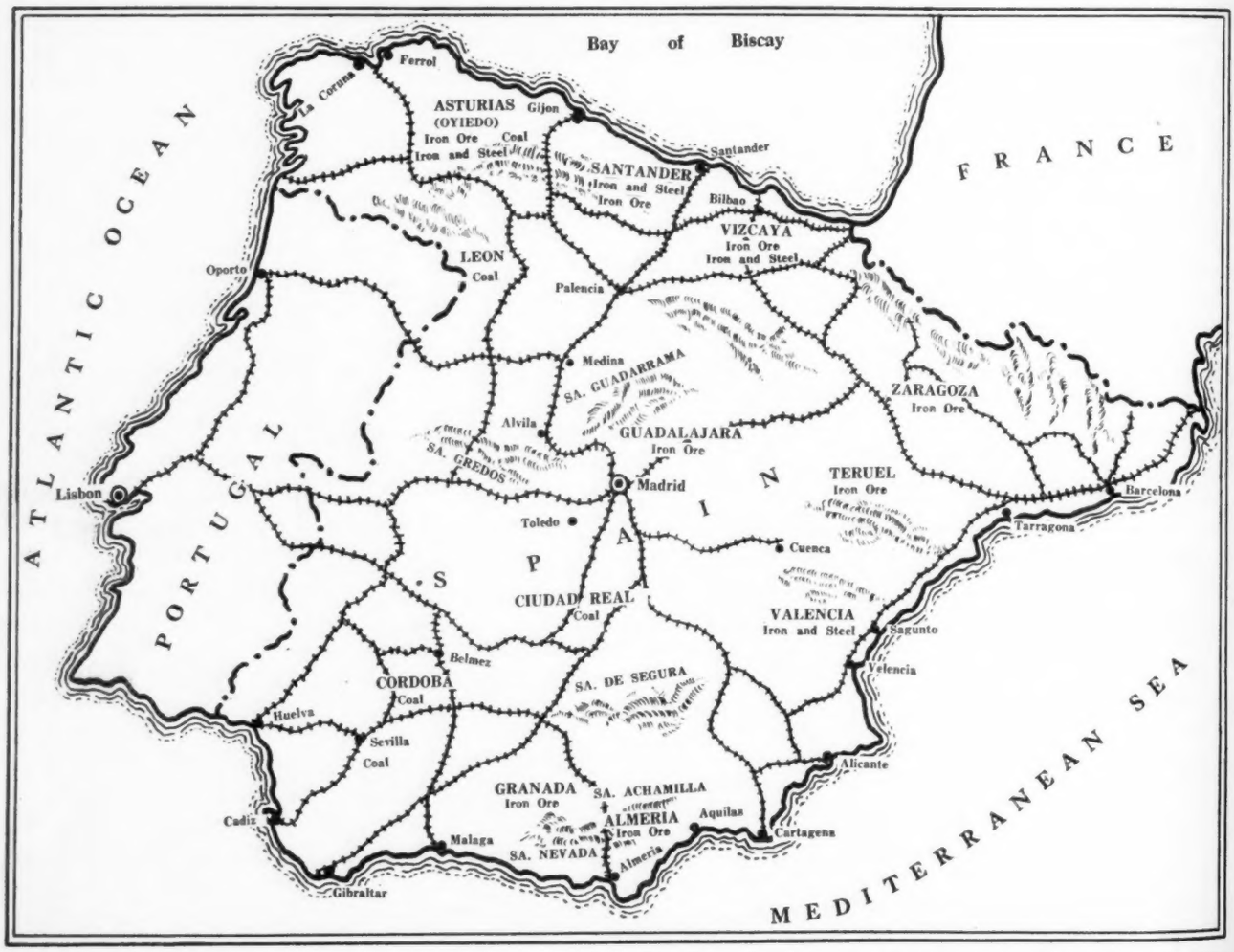
(*Concluded on Page* 888)

Table V

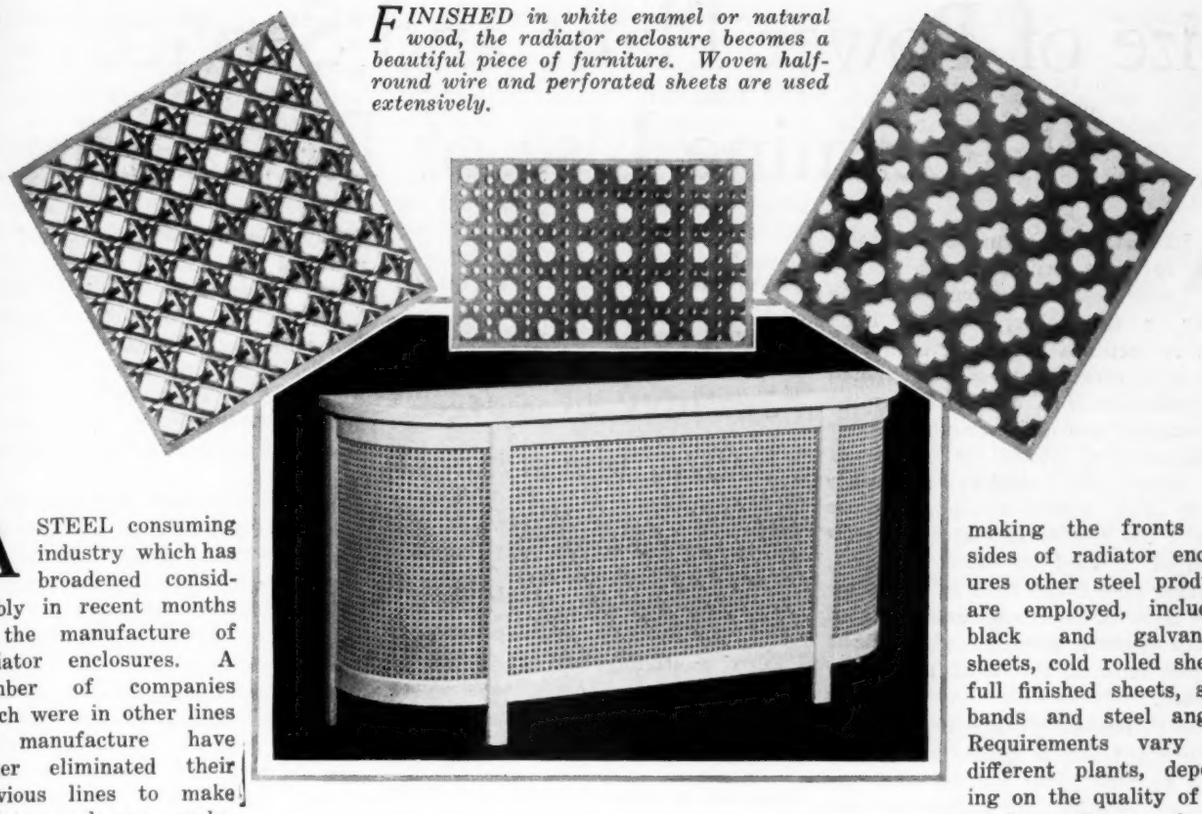
Spain's Mineral Output

(Metric tons)

	1927	1926
Anthracite	409,040	402,857
Coal	5,626,934	6,133,230
Lignite	423,757	399,830
Iron ore	4,906,300	3,181,589
Manganiferous iron ore	.....	9,082
Iron pyrites	.....	4,398
Manganese ore	37,159	44,947
Copper-iron pyrites	3,902,821	3,650,391
Copper ore	.....	286,682
Lead ore	160,761	216,043
Zinc ore	152,880	201,335
Sulphur	.....	64,867
CONVERTED MATERIAL		
Coke	845,605	832,210
Coal briquettes	645,724	686,707
Pig iron	611,778	486,846
Steel ingots	664,190	608,430
Puddled iron	.....	5,174
Copper	.....	48,325
Lead	121,937	149,514
Zinc	16,958	16,065
Refractories	.....	296,714



Spain's wealth "lies under the surface." This map shows the principal locations of its treasures in iron ore, coal and other minerals



FINISHED in white enamel or natural wood, the radiator enclosure becomes a beautiful piece of furniture. Woven half-round wire and perforated sheets are used extensively.

Radiator Enclosures Offer Growing Field for Use of Steel

By E. C. Kreutzberg

A STEEL consuming industry which has broadened considerably in recent months is the manufacture of radiator enclosures. A number of companies which were in other lines of manufacture have either eliminated their previous lines to make radiator enclosures exclusively, or have added them to their list of products. The manufacture of enclosures has not become a tonnage business in steel. Due to the fact that there are so many different styles and sizes of radiators it is necessary for the makers to base their business largely on custom built or made-to-measure principles. In localities where considerable hotel and apartment house work is in progress there is a vast field for development in quantity production, due to the fact that the radiators are more or less standardized. On this type of work competition is keen, and the outcome probably will be volume production of standardized enclosures.

The steel requirements are of primary importance to the manufacturers of perforated sheets, who are designing dies for the development of new and unusual patterns. The principal patterns which have been developed so far and have met with the greatest favor are: Perforated imitation cane, clover leaf designs, plain square designs and diagonal square grills. Even in this assortment there are several variations of each pattern, each manufacturer developing his own design and spacing of perforations.

A great deal depends on the pattern itself but even more on the perfection with which the pattern is executed. Careless die work results in irregularities and imperfections. It is apparent that perforating companies can ship only perfectly executed patterns to the enclosure trade, and furthermore it is essential that perforated sheets be so packed for shipment that they will be received in perfect condition. Imperfections quickly show up after painting or enameling has been completed.

Another artistic product has come into prominence for use in making fronts and sides of radiator enclosures. This is made of half oval steel wire or bronze wire, woven on looms, in a large number of patterns. This wire fabric is more expensive than perforated sheets, and hence is used more exclusively in the higher grade of radiator enclosures, as well as in many other lines of manufacture.

In addition to the perforated sheets and woven wire fabric which are used in making the fronts and sides of radiator enclosures other steel products are employed, including black and galvanized sheets, cold rolled sheets, full finished sheets, steel bands and steel angles. Requirements vary for different plants, depending on the quality of the product. Some of the manufacturers make enclosures which have only as much steel as is strictly necessary. Others make enclosures of such rigidity that they will withstand almost any abuse. Production of radiator enclosures is an industry which so far has been conducted with success by many small manufacturing organizations. The equipment used is comparatively simple, comprising forming machines, electric welding machines and a finishing department for spraying enamels and baking them.

As to the merits of radiator enclosures, one manufacturer says:

"They not only conceal the unsightly radiator but form an artistic and attractive piece of furniture and if properly constructed, protect the walls, furniture and draperies. The enclosures, when properly constructed, also increase heating value by throwing the heat out from the front, thus keeping it lower to the floor instead of permitting it to rise directly to the ceiling.

"With millions of residences, hotels, apartment houses, and other buildings already constructed or under construction there is a tremendous prospective outlook for the sale of steel radiator furniture. It is believed that this industry will be expanded tremendously during the next few years."

Size of Power Plant and Service Determine Use of Refractories

Water-Cooled Walls Replacing Firebrick Settings in Larger Boiler Installations

By R. A. Sherman

ALTHOUGH the furnaces in some of the earliest steam boilers were entirely surrounded by the water in the boiler, furnaces lined with refractories have long been considered essential parts of boilers, and the manufacture of fire bricks for the construction and maintenance of boiler furnaces is an important branch of the refractories industry. According to the latest figures available, 20 per cent of the fireclay refractories manufactured is used in boiler furnaces, a larger percentage than in any other one type of furnace except open-hearth steel furnaces, in which about 34 per cent of the total production is used.

Now, however, the literature of the power plant field is replete with references to "the boiler built around the furnace" in which no refractories are used. This has apparently caused some apprehension among the manufacturers of refractories as to the future status of this important market for their product. The remarkable advances which have been made in recent years in reducing the cost of generating steam are well known.

Refractories Limit Efficiency

Although the improvements in fuel-burning equipment, boilers and accessories have kept pace with the increased severity of service which results from more efficient combustion, higher ratings, and the use of lower grades of fuel, refractories have not, and the excessive cost of repairs and outage due to their failure often limits the efficiency and rating which could otherwise be obtained.

As "a chain is no stronger than its weakest link" the boiler and furnace are frequently no more reliable than the furnace lining. When power-plant engineers found that the refractories commercially available would not withstand the extreme conditions of service they demanded improved refractories; and when these were not forthcoming they adopted methods to lessen the severity of conditions without decrease in efficiency. Air cooling was first tried, the air being used for combustion; it is successful under moderate conditions but is limited in application because the thickness of wall between the flame and the air necessary for strength and the low thermal conductivity of fireclay bricks result in a low rate of heat transfer.

The next development was the protection or replacement of the refractories in the most severly affected areas by water or steam cooled surfaces which formed part of the circulating system of the boiler. These were successful, and because the rate and efficiency of heat transfer to the water or steam are high they have been extended to other parts of the furnace; in many furnaces refractories have been entirely eliminated. Power-plant engineers have been prone to place the blame for the lack of refractories which can withstand the conditions of service entirely on the ceramic engineer and the refractories manufacturer. The justice of this is a bit doubtful, for certainly the engineers should share the blame, as they should have realized that they were exceeding the safe working-limit set by the inherent properties of the materials.

The development and installation of the water-cooled furnace has progressed with increasing rapidity during the last three years. The report of 1927 of the subcommittee on boilers, superheaters and economizers of the prime movers committee of the National Electric Light association shows that some type of water-cooled walls is in use or being tried by 70 per cent of the member companies which reported. They are evidently proving their worth, and their use will undoubtedly continue to increase in certain fields. However, the initial cost of water-cooled walls is generally greater than that of firebrick settings; therefore, their use is limited to those plants in which conditions of operation justify the increased investment necessary to secure high efficiencies and ratings. These conditions include: High cost of fuel per ton or per unit of output of product; high load factor; and the use of fuel whose ash causes excessive slagging of refractories. Further, they can be used only with pure boiler feed water because of the danger of tube failure due to the increased rate of scale formation at the high rates of heat transfer. These conditions are obtained and the field of water-cooled walls lies, therefore, among large central heating and electric-generating stations and certain large industrial power plants.

Small public utility or industrial power plants generally have a low load factor and therefore operate at low efficiencies because the investment in the equipment for higher efficiencies is not justified. Their refractories service conditions are not ordinarily extremely severe, or even if they are the plant often can better afford to reduce the severity by operation at lower efficiencies than to make the investment necessary for water-cooled furnaces. There is a real demand, however, for better service from their refractories. The use of plastic refractories is increasing in these plants because of the lower cost of labor for their installation.

Even Choice in Smaller Plants

Between the extremes of the large and small power plants lie those plants of moderate size or of moderate severity of service, in many of which there may be an even choice between refractories and water-cooled furnaces.

The future status of refractories in power plants largely depends, therefore, on the maintenance of their position in the plants of moderate size. There are two principal lines of progress open to the manufacturer of refractories: The improvement of his product; and the proper application of his present product. Stuart

From technical bulletin 18, American Refractories institute, presented at the joint meeting of the American Institute of Chemical Engineers and American Refractories institute, St. Louis, Dec. 6, 1927. The author is associate fuel engineer, Pittsburgh experiment station, bureau of mines.

M. Phelps[1] has stated, in regard to the improvement of refractories, that a study of the base materials which offer possibilities for refractory products will show that pronounced advancement in the development of these materials cannot be expected. However, little information is available on the minerals formed in the manufacture or in the service of a fire brick, and it is on the relative amounts of these minerals rather than on the chemical composition of the raw materials that the properties of refractories depend. The use of special refractories made from other than fireclays is deterred by their high cost.

More hope for progress is probable in the proper application of the present product. Definite knowledge of the capabilities and limitation of refractories has been hampered in the past by the lack of definite information on the conditions of service, and on the mechanism of failure of refractories. During the past three and a half years the United States bureau of mines, in co-operation with a special research committee of the American Society of Mechanical Engineers, has conducted a field investigation of refractories service conditions in boiler furnaces which has included the principal types of fuels and fuel-burning equipment. All the factors which might be supposed to govern the life of refractories have been studied both qualitatively and quantitatively, and many data have been supplied to the ceramic engineer which were not previously available. Although the principal objective was to supply this information to aid the ceramic engineer in the study of the mechanism of failure and it was but a means to an end, much of the information may be of immediate, practical value to the manufacturer. The mechanism of the failure of refractories is being studied under the same co-operation by the United States bureau of standards and also by the University of Illinois, Champaign, Ill.

This investigation is the broadest and most fundamental of any phase of the refractories problem ever undertaken, and it affords manufacturers their best opportunity to obtain information necessary to advance their industry, for the application of the results is not confined to the boiler-furnace field. The support of this investigation by manufacturers of refractories has been disappointing. Only twelve have contributed to the fund, and their contributions have amounted to 12 per cent of the total. Operators of industrial power plants have contributed 16 per cent; central electric-generating stations, 44 per cent; and power-plant designers, gas companies, and manufacturers of boilers, fuel-burning equipment, and furnace accessories, 28 per cent.

The adoption of water-cooled walls for furnaces in those power plants in which the conditions of service exceed the inherent limitations of refractories should benefit rather than harm the refractories industry.

[1]In a paper "Properties of Refractories and Their Relation to Conditions in Service," presented at the First National Fuels meeting, St. Louis, Oct. 10-13, 1927.

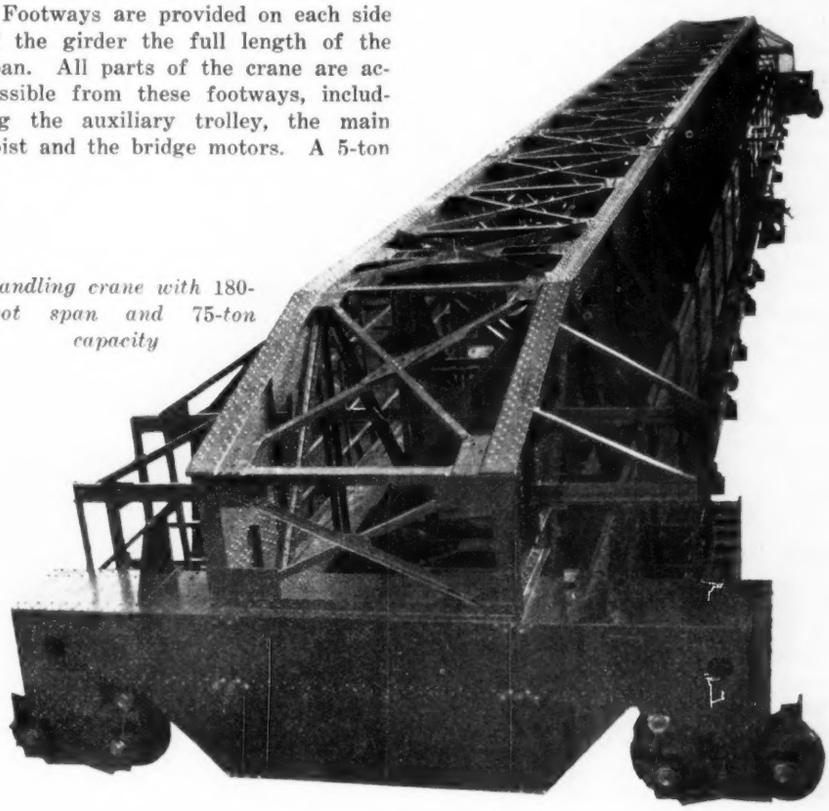
Overhead Crane Handles 170-Foot Sheets

ONE of the largest cranes in the world for handling the product of a continuous sheet mill recently was completed by the Alliance Machine Co., Alliance, O., for the American Sheet & Tin Plate Co., Gary, Ind. Its capacity is 75 tons and span 180 feet. In designing a crane of this size the difficulties, which had to be overcome, included the length and weight of the pieces to be handled, the maximum length of the sheets being 170 feet; the small space required to deposit the sheets in piling; and, the deflection of the carrying hanger.

The main hoist includes a stationary gearing located at the center of the span with two drums interlocked and driven by two 85-horsepower motors through worm gear reductions. Due to the length of the hanger, which carries the plates, four different points of attachment for the hoist ropes are provided. All points are equalized through the ropes to reduce the deflection on the hanger to a minimum. The plates are carried by 35 hooks, spaced on 5-foot centers. The hooks are carried by a built-up structural beam, 170 feet long, upon which the main hoist blocks are fastened; the hooks are capable of turning through 180 degrees. The turning motor is at the beam center.

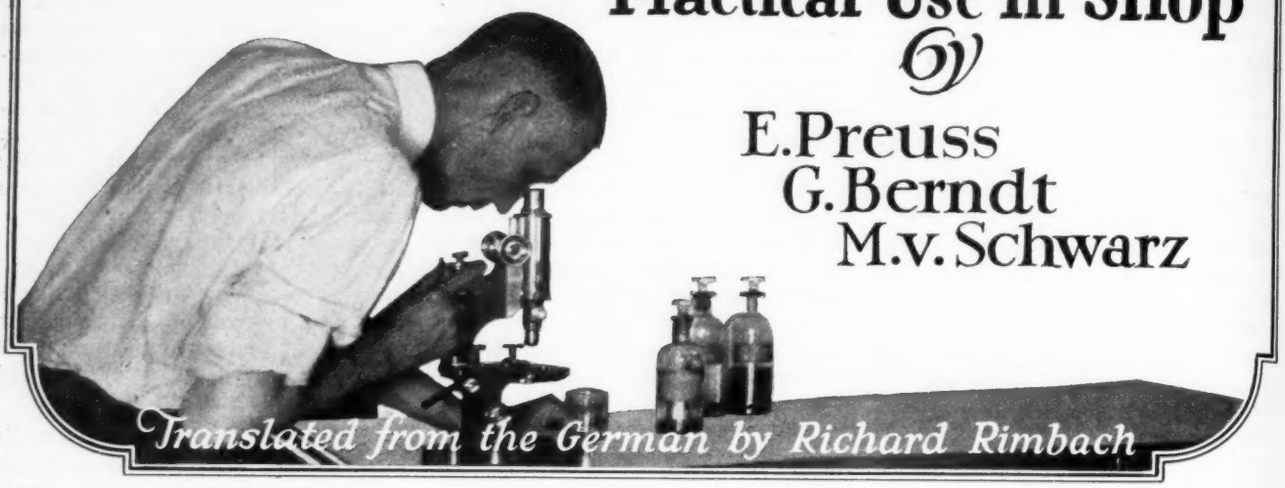
All hooks are geared together and turn simultaneously. After depositing the plates on the supports the hooks are lowered and turned, thus allowing only enough space between each pile for hook removal. The bridge is driven on both sides by four 45-horsepower motors. These are placed one at each corner, a squaring shaft running the full length of the span at each side. This keeps the crane square with the building.

Footways are provided on each side of the girder the full length of the span. All parts of the crane are accessible from these footways, including the auxiliary trolley, the main hoist and the bridge motors. A 5-ton auxiliary trolley is provided on one side of the main hoist and runs the full length of the span, the runway being suspended from one side of the main girder smiliar to the ore bridge principle. The operator's cage is at full view of his work at all times.



Handling crane with 180-foot span and 75-ton capacity

Metallography Simplified for Practical Use In Shop



By
E. Preuss
G. Berndt
M. v. Schwarz

Translated from the German by Richard Rimbach

Chap. VI—General Grinding, Polishing and Etching of Samples. The Metal Microscope

TEST pieces for microscopic investigation, from which more far reaching conclusions are obtained in regard to the structure than is possible by the macroscopic test, also require greater care in the preparation of the finished section on account of the necessarily larger magnification. Moreover, the finished section must be polished. The surfaces of the samples vary between 0.5 and 2 square centimeters. The pieces are made 1 centimeter thick for convenience in grinding. Small pieces are made from 5 to 6 millimeters thick to prevent tilting during the grinding process and to obtain a flat surface. Otherwise the statements made in discussing macroscopic investigations also hold for the preparation of samples for microscopic examination.

If larger surfaces are required for the investigation and careful polishing as a whole is not possible or takes considerable time, a number of sample pieces are taken from the piece at different places. In taking the sample, every mechanical stress, which would destroy the structure, must be avoided; they cannot be cut with a shear, but must be prepared by sawing, drilling or turning. Hardened pieces are nicked at the edge with a grinding disk and broken off. As with the later grinding pronounced heatings must be avoided to prevent a change in structure and consequently heating effect. If the samples are cut with a torch, the ground surface must be taken at least 1 to 2 centimeters from the burned surface to make certain that it lies outside of the heated zone.

If the cause of fracture of a machine part is to be determined, the sample is purposely chosen in the immediate vicinity of the fracture surface; in fact, parallel as well as perpendicular to it. In addition a test piece is taken at a considerable distance from the fracture, in order to be able to compare the structure of the unstressed material with any local irregularities in the neighborhood of the fracture.

Fig. 62—Horizontal grinding and polishing machine

Wire is mounted in small pieces of a similar metal. The pieces have a hole drilled into them of the exact diameter of the wire, to hold the wire tightly; in case no other method is possible the samples are mounted in Wood's metal. Heating is accomplished in a water bath, so that no change in structure can occur. See Fig. 63a. Longitudinal sections of thin wires are mounted in pieces with notches. Sheets for grinding and polishing are mounted in a clamp consisting of two plates about ½-centimeter thick held together by screws. Irregularly shaped pieces can be forced into tubes and only in rare cases are they mounted in a white metal alloy of the lowest possible melting point such as Wood's metal, so that the action of the heat does not change the structure of the sample. Sometimes it is easier and quicker to hold the wire or sheet, as shown in Figs. 63b and 63c, between the legs of a U-shaped piece of a similar material about 3 or 4 millimeters thick. The two sides then are pressed together in the jaws of a vise, without squeezing the sample.

Of the various methods for polishing the samples only that developed by A. Martens and E. Heyn will be discussed. The polishing of small samples is accomplished by

emery paper, placed loosely on a surface plate. In the polishing of larger samples it is advisable to glue the emery paper either on built-up beechwood disks or better on metal disks of about 350 millimeters diameter. A cast-iron fitting can be screwed to the wooden disks, and they can be mounted on a lathe or on a ½ or 1 horsepower motor of 300 to 500 revolutions per minute.

Most of the grinding and polishing machines are equipped with horizontal shafts, so that the disks are located vertically. This, however, has many disadvantages, especially as the polishing material is continually trickling away and is thrown off when the disk rotates at high speed. One of the authors recommends a horizontal polishing disk, shown in Fig. 62. In this case usually two flat wheels of an aluminum alloy, each of different size are used for polishing and several other for mounting the emery.

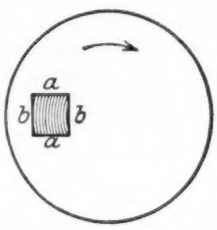


Fig. 64—Grinding the sample

The mounting of the emery paper on the metal wheels is done by filtered carpenter's glue, by means of a water glass solution. After wearing out the first piece of emery it is possible to mount more on top of the first, up to ten pieces. The several layers are removed occasionally by turning in a lathe. The emery paper must contain only emery of uniform composition; otherwise, the surface is scratched, which interferes with the examination. The grain sizes used most satisfactorily include Nos. 1 and 2 coarse, No. 1 medium and fine, No. 0 fine, No. 00 and No. 000 fine. Dry grinding always is employed. In the case of No. 00 fine, however, several drops of oil are placed on the emery paper. The polished sample is pressed lightly against the polishing surface; heavy pressure as usually is the custom in polishing, should be avoided, on account of the frictional heating. This heating may easily cause a structural change; on the other hand a perfect polish cannot be obtained in this way. If possible, several samples should be prepared at the same time. Polishing is started with a No. 1 or 2 coarse paper; after polishing, the sample is placed with the polished surface on a clean flat metal surface plate, to remove the

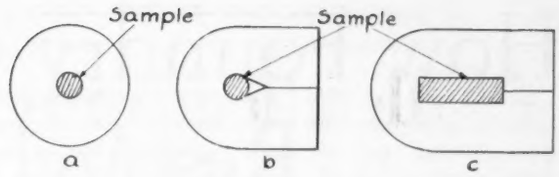


Fig. 63—Methods of handling small samples for grinding

heat generated during polishing and to cool down the sample until starting the polishing on the next wheel.

If the coarsest paper causes scratches on the surface in the direction *aa* in Fig. 64, the sample is held against the next finer paper in such a way that the new polishing scratches make a certain angle or are 90 degrees to the original scratches in the direction *bb*. In the same manner, polishing is carried out on the following wheels. In no case is it advisable to stop the polishing on one wheel and go to the next finer one, until all scratches of the previous disks are removed completely. If this precaution is not taken, the scratches, which were not removed completely at the beginning, come out markedly during the polishing on the cloth wheel, Fig. 65. Thus, the polished surface is unsatisfactory and the operation must be repeated.

Application of Final Polish

After polishing on the last wheel with the paper No. 00 and No. 000 fine, the sample receives a final polish. This polish takes place on a wheel covered with broadcloth. Levigated alumina, which is used as the polishing compound, is applied to the disk by a wash bottle or by a camel's hair brush. The sample is polished on the cloth disk turning continuously, until it shows a perfectly smooth surface free from all scratches. It then is washed carefully with water under the tap, dried by washing with alcohol and wiped lightly with a soft cloth. If the sample is not etched immediately after the polishing, it must be kept in a desiccator with calcium chloride and soda lime. The complete grinding and polishing takes from 10 to 30 minutes, although it can be reduced 7 to 10 minutes by suitable equipment.

After polishing it is generally not possible to detect on the polished surface with the naked eye or the microscope any details other than scratches, cracks and nonmetallic inclusions; the structure first must be developed by etching. For this purpose a number of reagents have been suggested. Good results are obtained by etching in a 1 to 2 per cent alcoholic solution of nitric acid. Generally it is advisable to use only the smallest possible amount of the reagent, of which a large stock should be kept on hand. Only if satisfactory results cannot be obtained should others be used since certain etching reagents have special advantages for certain purposes. To distinguish the cementite (iron carbide) from ferrite (pure iron), the sample is immersed in a 50 per cent sodium hydroxide solution to which a saturated solution of picric acid in water has been added. The cementite is colored dark, while the ferrite is hardly attacked. The etching is carried out in a porcelain dish on a boiling water bath and takes 3 to 5 minutes. The solution should be protected against light in a brown glass bottle closed with a rubber stopper.

Before immersing in the etching solution the polished surface is, if necessary, again cleaned carefully with alcohol. The sample then is placed, as described in the macroscopic etching, into the etching solution and kept therein with continuous movement of the dish, until the originally bright shining surface takes on a slightly dull, milky color. This in the case of iron and unhardened steel takes 10 to 30 seconds and in the case of hardened steel and special steels a slightly longer time. It is possible to follow the advancing action of the etching reagent, by taking the sample out of the etching solution several times, washing, drying and examining under the microscope. If the etching has not been sufficient, the sample is again immersed in the etching solution. After the final removal of the sample, the etching solution must be removed from the surface by careful washing with water and alcohol. The rusting of the polished surface is avoided by keeping the sample in a desiccator; in this way the microstructure can be preserved for years.

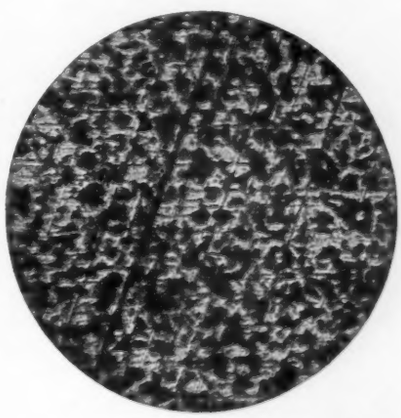


Fig. 65—Grinding scratches. X 85

How Foundry Operates Extensive Research Laboratory

By W. C. Hamilton

DURING the war, the American Steel Foundries operated a forge plant on their property at East Chicago, Ind. All of the buildings now have been dismantled with the exception of the power house, a part of which has been remodeled to house a research laboratory.

The laboratory is divided into several departments. The work room covers a space 36 by 80 feet, the chemical laboratory a space 20 by 40 feet with a balance room 12 by 20 feet, and the metallographic room a space 9 by 19 feet. In addition, there is a dark room, a library and two large offices. The following equipment has been installed:

High frequency induction furnace made by the Ajax Electrothermic Corp., Trenton, N. J.

Industrial gas furnace with automatic control supplied by the Chicago Flexible Shaft Co., Chicago.

Two furnaces with automatic control built by the Leeds & Northrup Co., Philadelphia.

Dilatometer and coefficient of expansion furnace supplied by Wilson-Maulen Co. Inc., New York.

Critical temperature instrument built by the Leeds & Northrup Co.

Endurance testing machine developed by R. R. Moore.

Impact testing machine and tensile machine, 100,000 pounds capacity, built by Riehle Bros. Testing Machine Co., Philadelphia.

Scleroscope built by the Shore Instrument Co., Jamaica, N. Y.

Brinell hardness testing machine built by Tinius Olsen Testing Machine Co., Philadelphia.

Hardness testing machine supplied by Wilson-Maulen Co. Inc.

Two wear testing machines.

Metallographic outfit (with lenses good for a visual magnification up to 2500 diameters and a photographic magnification up to 10,000 diameters. There is also a special lens for macrostructures from normal size to a magnification of eight diameters).

Polishing equipment for microscopic work.

The machine shop is equipped to take care of the work necessary in the preparation of the different test specimens. A number of accompanying illustrations show certain equipment and its arrangement.

Heat treatment of the tests is carried out mostly in the furnaces built by the Leeds & Northrup Co., although the gas furnace is used when temperatures over 2000 degrees Fahr. are desired. It is, of course, desirable to obtain the critical temperatures of the different compositions before the steel is heat treated.

The furnaces are well suited to the drawing of specimens, as they can be controlled automatically to any temperature up to 2000 degrees Fahr. Chromel-alumel couples are used in these furnaces. Automatic attach-

From a paper presented at the Philadelphia convention of the American Foundrymen's association, May 14-18, 1928. The author is research director, American Steel Foundries, Indiana Harbor, Ind.

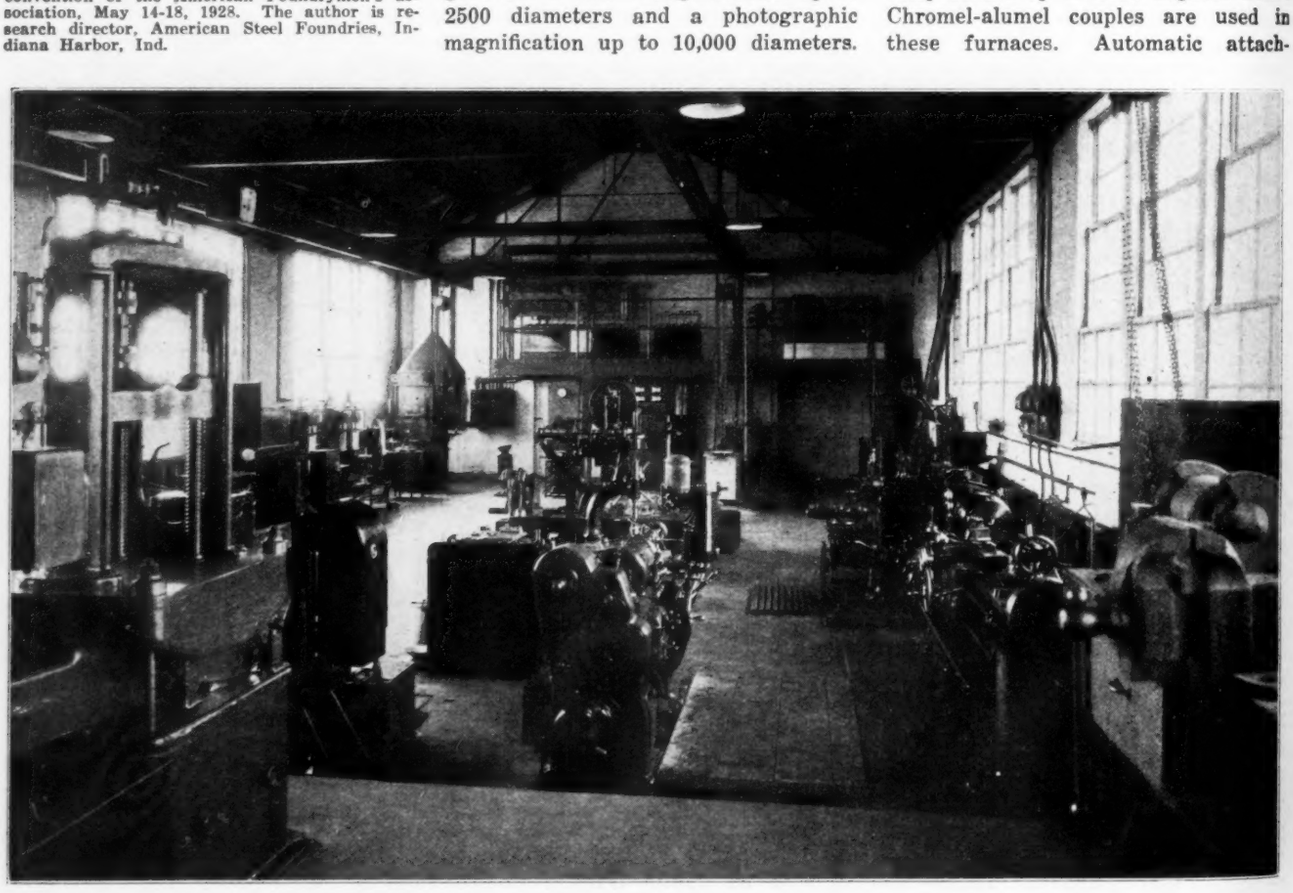


FIG. 1—GENERAL VIEW OF THE RESEARCH LABORATORY WORK ROOM SHOWING THE VARIOUS PIECES OF APPARATUS

ments have been added whereby either a bell is rung or the power is shut off after a certain period. By this arrangement, a long test may be stopped on the night turn with no supervision.

The machine shop has the equipment necessary to prepare test specimens. A grinder made by the Heald Machine Co., Worcester, Mass., with a magnetic chuck to hold specimens is useful in the preparation of parallel surfaces with a smooth finish to be used for hardness testing and macrograph examinations.

The pull tests are made on standard two inch bars, the stress strain diagrams being obtained by the autographic attachment and their interpretation is made by the Johnson method.

Wear testing determinations made with the machines presented many problems before satisfactory results were obtained.

Specimens 1¾-inch in diameter with a width up to ⅜-inch are used. One specimen revolves at a speed of 10 per cent less than the other when the diameters of the two specimens are the same, so that a slippage between the specimens is maintained. In the work so far, one specimen has been made of a definite composition at a definite hardness, this hardness being greater than the hardness of any of the specimens under investigation. The hard standard is run at the faster speed and as the specimen, under test wears away, the reduced diameter results in a greater difference in the peripheral speeds of the two specimens. This arrangement of course exaggerates the wearing conditions of a metal that does not resist wear. In other words, a specimen that starts to wear rather decidedly with a 10 per cent slippage will wear more rapidly as this slippage increases, due to the wearing and consequent reduction in diameter of the specimen.

In addition to the slippage an adjustable lateral motion is given to the specimens as desired and it is also possible to give a bumping action to the specimens. There is also an attachment whereby the friction between the two specimens may be measured.

The machines as delivered are equipped with a spring attachment whereby the load is applied to disks 1¾ inches in diameter revolving against each other in opposite directions and running at a speed of approximately 10,000 revolutions per hour. As the specimens wore, the tension on the spring became less and therefore the load could not be maintained constant. A floating load hanging on springs has been substituted with good results.

However, the most annoying obstacle has been the formation of iron oxide on the wearing surfaces, especially when the tests are over rockwell-"C" 45. The oxide acts as a lubricant, preventing natural wear. Fans were installed to cool the specimens and the blast of air removes much of the metal as it is worn into a powder. Nevertheless there is a skin heating due to the friction and a formation of iron oxide with which to contend.

When the wearing action is rapid the worn metal and oxide do not adhere to the specimen. In this case the worn particles are of a flaky nature and are blown away by the fan. On the other hand, when the wear is slight the few particles formed are of microscopic size and hence are changed more readily to iron oxide which forms as a glaze on the specimen.

The bureau of standards has reported this difficulty and has used a strip of copper pressed against both the specimens to remove this glaze of iron oxide, with more or less success. In our work we have avoided placing any material against our specimen under test but have used both copper and spring steel in contact with the standard. In every case the prevention of the oxide glaze on the standard insures no glaze on the softer specimen being tested. The spring steel has been found more efficient than the copper, but whatever is used must make perfect contact with the periphery of the standard specimen.

The load and number of revolutions in use were decided upon after a number of preliminary tests under different conditions. The load per square inch is not known, as we do not know the area of contact between the two disks. It was found that certain loads distorted the metal too severely and we finally decided on a load of 50 kilograms and 50,000 revolutions for specimens up to a hardness of rockwell-"C" 45. The specimens weigh 65 grams and the test results in a loss of 4 grams or 6 per cent as a maximum, the time required being slightly less than 5 hours. Greater loads of course, are necessary under certain conditions.

The metallographic work being done on steel may be divided into three classes:

First.—Photomicrographs from normal size to a magnification of eight diameters.

Second.—Photomicrographs at a magnification of 100 diameters.

Third.—Photomicrographs at a magnification of 1000 diameters.

In this attempt a magnification higher than 1000 diameters often is necessary. It is felt that a good

(*Concluded on Page* 841)

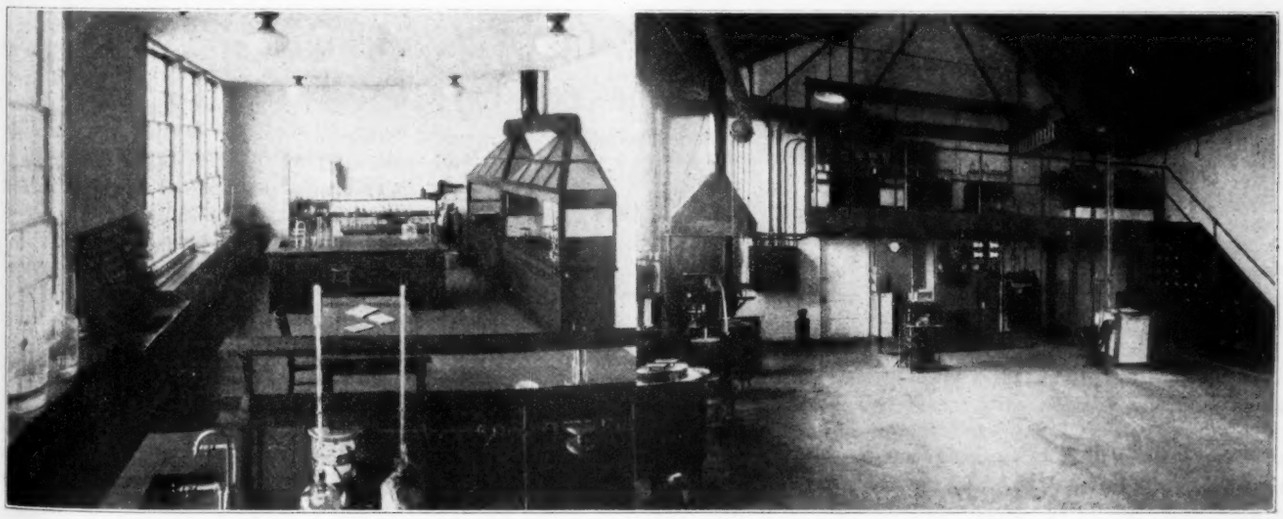
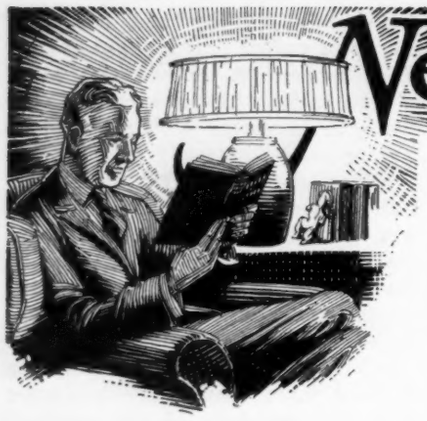


FIG. 2—CHEMICAL LABORATORY OF THE RESEARCH DEPARTMENT. FIG. 3—VARIOUS TYPES OF FURNACES ARE USED FOR HEAT TREATING AND MELTING



New Books Worth Reading

Authority of Steel Industry

Annual Statistical Report of American Iron and Steel Institute, for 1927, published by the Institute; cloth, 119 pages; 6 x 9 inches; supplied by IRON TRADE REVIEW for $5, and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1 5s, net.

This is the sixteenth annual statistical report of the Institute, and forms the authoritative basis of all iron and steel statistics for the United States. In addition to the usual statistics of the industry in the United States this volume contains data relating to production in the principal foreign countries. This covers iron ore, pig iron and steel ingots and castings, as far as practicable, from 1900 to 1927. The fiigures are from official reports and other reliable sources. Another new feature is an analysis of tonnages of iron and steel products exported, showing exports for 1923-1927, inclusive, to principal foreign countries. Separation of pig iron and ferroalloy production, introduced in 1926, is continued. This has been carried back to 1900.

In addition to statistical matter gathered by the institute the volume contains other information from governmental and other sources of a reliable nature, rounding out the complete picture of the iron and steel industry.

* * *

Safety as an Investment

Safety and Production, by the American Engineering council published by Harper & Bros.; cloth, 414 pages, 267 charts and tables; supplied by IRON TRADE REVIEW for $5 and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1 5s, net.

The influence of safety work on production is studied and an answer is given to the question whether safety pays. The volume is an engineering and statistical study of the relationship between industrial safety and production. It is a comprehensive survey of the close tieup between low production costs and good safety work. Sixty products groups in 20 basic industries have been studied and the experience of 14,000 American plants with 2,500,000 workers and 54 billion man-hours of work have been recorded.

Results of the analysis show conclusively the close relation of highest productivity to efficient accident reduction effort.

* * *

Defining Business Problems

Money Problems of Business Men, by William B. Castenholz and Alan Robert Murray; published by Schill & Co., Los Angeles; cloth 313 pages, 5¼ x 7¾ inches; supplied by IRON TRADE REVIEW for $5 and in Europe by Penton Publishing Co. Ltd., Caxton House, London, for £1 5s, net.

Getting back to first principles the authors of this volume seek to define the basic purpose of business, what it is all about, and then to apply principles to its conduct in a way to bring success. In the effort to bring before the business man the realities of business the authors have taken the simplest possible illustrations, have stripped ordinary business phrases of their mystery and have reduced them to elemental facts and discussed them in words almost of one syllable.

An explanation is given of how a man may know the real facts of his business, may take a look at his capital, take the risks out of business, obtain working capital through credit, handle creditors, grant credit and make collections.

* * *

Foundry Sand Test Methods

Standard and Tentatively Adopted Methods of Testing and Grading Foundry Sands, 1928. Published by the American Foundrymen's association, 222 W. Adams street, Chicago; 94 pp., 6 x 9 inches; 31 illustrations; paper cover; supplied by IRON TRADE REVIEW, Cleveland, for $3.

This publication is a revision of the foundry sand test methods issued by the joint committee on molding sand research in 1924, and contains in addition descriptions of testing procedures developed since 1924.

Controlling specifications are given, with general information as to methods of conducting tests and details of construction of apparatus which has been found satisfactory for performing the tests.

The standards given are tests for moisture content, permeability, strength by compression method and for grain fineness and clay content and procedure for making chemical analysis. The tentative standards include tests for green sand strength by transverse method, green sand strength by tensile method, green sand strength by shear method, baked core strength by tensile method, baked core strength by transverse method, dye adsorption qualities as indicating bond strength, sintering qualities as indicating refractoriness and grading classifications for grain fineness and for clay content.

* * *

Handbook in Bound Form

A. S. S. T. Handbook 1929, published by the American Society for Steel Treating, Cleveland; fabricoid, 670 pages, 4¼ x 7 inches; supplied by IRON TRADE REVIEW to members of the American Society for Steel Treating and Institute of Metals division of the Institute of Mining and Metallurgical Engineers for $5 and to nonmembers for $7.50.

This volume is the publication in bound form of the data sheets which the American Society for Steel Treating has issued in loose-leaf form for almost five years. The book is prepared to give comprehensive and concise information on metallurgical practices pertaining to the manufacture, treatment and use of metals. The data and practices formally adopted and authorized by the society as "standard recommended practices" are designated by a footnote. The recommended practices are not intended as specifications but should be interpreted by the reader in the light of his own personal experience.

At the close of 1927, the society's loose leaf handbook contained 442 pages devoted to 61 subjects. During the year about 150 pages on 39 subjects have been added and certain deletions of obsolete information have been made, making the total in bound form 582 pages on 100 subjects. Principal divisions of the book are as follows: General data; heat treatments; carburizing; steels and alloying elements; cast iron; pyrometry; metallography; testing; furnaces, heat application and refractories; forging; and nonferrous.

One of the important additions to material in 1928 was the nonferrous section containing approximately 100 pages. Through a co-operative arrangement, the data for this section

was prepared for the nonferrous data sheet committee of the institute of metals division of the American Institute of Mining and Metallurgical Engineers and the recommended practice committee of the American Society for Steel Treating.

Inasmuch as a considerable portion of the information contained in the new *Handbook* was compiled by the American Society for Steel Treating, it is available from no other source, therefore the volume is recommended highly. Engineers, metallurgists, chemists and heat treaters will find the book valuable for quick reference.

* * *

Modern Boiler Room Practice

Finding and Stopping Waste in Modern Boiler Rooms, edited by George H. Gibson, member American Society of Mechanical Engineers; published by Cochrane Corp., Philadelphia; 804 pages, 5 x 7 inches; numerous charts and illustrations; flexible cloth binding; supplied by IRON TRADE REVIEW, Cleveland, for $3.

This is a reference book of text, tables and charts compiled from papers read before engineering societies, books, articles in technical periodicals, publications of the U. S. Bureau of Mines, and other original sources, and put into convenient form for owners, managers, engineers, firemen and others interested in increasing and maintaining boiler plant economy. The five sections are on the subjects of fuels, combustion, heat absorption, boiler efficiency and testing, and feed water heating and conditioning. The aim has been to present data and methods by means of which a reasonably intelligent man can choose and evaluate fuels, select the type of equipment best adapted for burning them, operate such equipment at the highest efficiency and secure efficient transfer of the heat thus developed to the steam. The final section discusses recent practice in heat balancing, water conditioning and protection of the boiler and auxiliary equipment from scaling, embrittlement and corrosion. The work of a great number of investigators is critically digested and concisely presented.

How Foundry Operates Research Laboratory

(*Concluded from Page* 839)

method for the identification of impurities is lacking, and on account of the complex nature of these impurities it seems that the chemist and metallographists must work hand in hand.

The chemical laboratory was built sufficiently large to take care of work of various natures, but so far the work has been mostly analytical.

Inhibitors Reduce Pickling Vapors

IN MANY processes of working up iron to finished products such as sheets; tubes; wire; zinced, tinned and enameled sheets; and ironware, it is necessary in the process of manufacture to remove the layer of oxide, which is formed during the annealing, by pickling with sulphuric or hydrochloric acid. Picklers frequently are exposed to the escaping acid vapors, the main source of which lies in the fact that the acid not only dissolves the iron oxide but also the metallic iron. The hydrogen formed rises in bubbles which burst on the surface of the pickling bath and carry with them particles of acid into the air of the pickling room. Certain quantities of carbon, sulphur, phosphorus and silicon oxides are developed during the dissolving of this iron in acids in addition to oxygen. Some of the compounds thus formed cause irritation of the mucous membrane of the eyes, the throat and lungs, as well as injury to the teeth.

An inhibitor added to the pickling liquid in small quantities alters the qualities of the mineral acids in such a way that they do not attack the metallic iron while the oxide film is dissolved completely during the pickling process. By this addition no carbonic or arsenic oxides are formed thus eliminating the chief source of the injuries to health.

Experiments clearly show that the addition of an inhibitor effects a reduction in the vapors escaping from acid vats, that the air does not appear to be rendered impure to any perceptible extent and in the event of no other unfavorable circumstances existing there is no necessity for installing vapor cowls. In one factory it was mentioned that the effect of the acid vapor on the teeth had completely disappeared since the use of an inhibitor. Moreover, the hands of the picklers do not suffer in the same degree from the acid in which an inhibitor has been dissolved as formerly was the case.

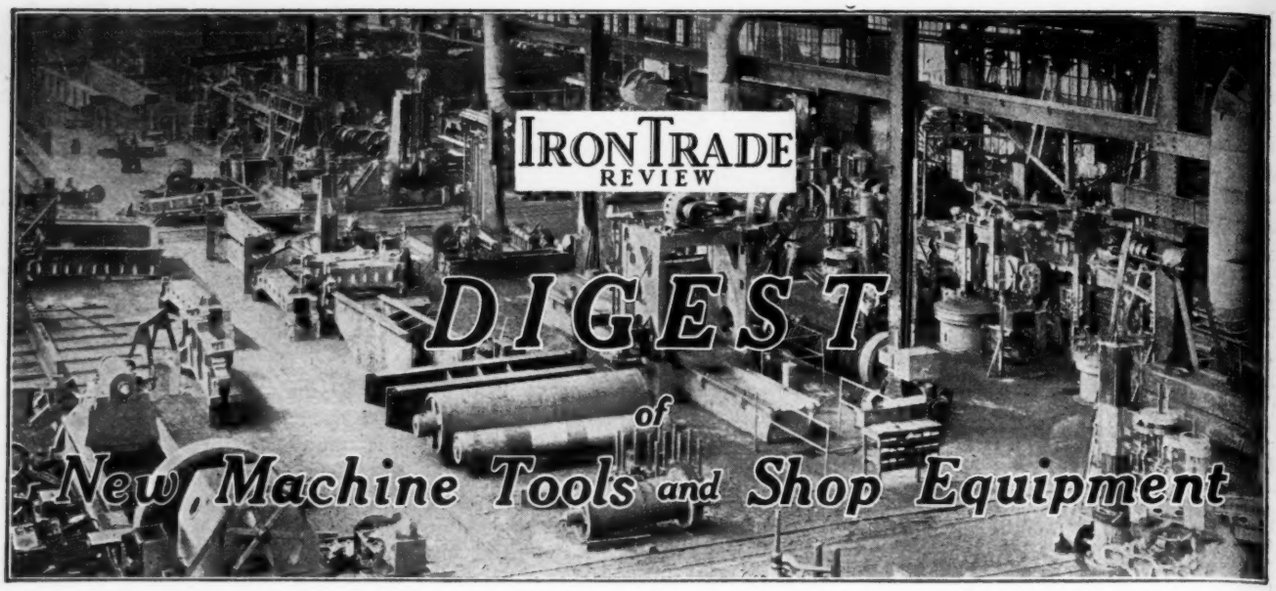
Saving Is Effected

One important advantage of an inhibitor is in the saving of pickling material, which is due to the fact that only the layer of oxide is dissolved while the pure metal is not corroded or only affected to a slight extent. The metal even when it remains for a considerable time in the pickling bath, is only to a slight extent attacked by the acid. In some pickling plants the work is arranged so that the material is left over night in the pickling bath without injury occurring on that account.

What is true of the material to be pickled applies also to chains and baskets used for dipping the material in the vats, the life of which is greatly increased according to the experience of many pickling plant operators. For wire drawing, the elimination of the fragility due to pickling and for enameling and zincing works the avoidance of the pickling blisters are of great importance. At one factory it was ascertained that the the avoidance of the pickling blisters had been reduced from 15 to 1 per cent since introducing an inhibitor.

The quantity of acid which without the addition of the inhibitor would be consumed for the undesirable dissolution of the pure metal and the corrosion on the pickling instruments, is saved. Some factories compute this saving to be as much as 30 per cent and more of the previous consumption of the acid. If the consumption of the acid is reduced the quantity of waste pickle is reduced and there is the saving of the cost incurred for neutralizing these waters or in other ways rendering them innocuous. As the metallic iron is no longer attacked by the sulphuric acid saturated with the inhibitor, the pickling baths can be made considerably more concentrated than before without any danger of overpickling the material. Cold pickling can be used thus saving the cost of steam required for warming up the pickling baths. Many plants have indicated the advantage that the surface of the pickled material remains smoother and it is more easily worked up on the drawing benches and in wire drawing. There also is a saving in coating the sheets, wire and ironware with tin or zinc when they have been pickled with the addition of an inhibitor.

The accompanying discussion, by Dr. Kremer, industrial counselor, Dusseldorf, Germany, is presented through the courtesy of William W. Hearne Inc., Philadelphia, importers and distributors of an inhibitor for pickling.



Finds Tool Joints Lack Rigidity

AT LAST week's national meeting of the machine shop practice division of the American Society of Mechanical Engineers held in Cincinnati, one session was a symposium devoted to the use and application of machine tools in various industries. Four papers were read and discussed and these dealt with the automotive, electrical, agricultural implement and railroad fields. The authors of these papers for the most part commended machine tool builders for the performance and efficiency of modern production machinery and found little to criticize. In all cases the criticism was constructive.

In a most interesting paper on the use of machine tools in the farm implement and tractor industries, Max Sklovsky, chief engineer, Deere & Co., Moline, Ill., made some comment on rigidity, his experience having shown that the lack of rigidity can be traced to improperly fastened joints. Mr. Sklovsky's observations in this connection were as follows:

Rigidity Is Essential

Rigidity of machinery where chiseling tools are used is universally recognized as essential, but many designers, unfortunately, have overlooked one element of rigidity, namely, that of the joints. Parts of machine tools are designed most generally with sufficient rigidity, but the fastening of these by means of bolts and studs is usually insufficient, and the factor of rigidity of a joint is very frequently one-fiftieth part of the factor of rigidity of the remainder of such machine.

Not long ago, on inspecting a machine tool, well designed and rigid in every other respect, two major members were found to be fastened together by six ¾-inch bolts. Study indicated that this machine was lacking in rigidity to such an extent that tool chatter was noticeable, and the resulting product inaccurate. A redesign of this machine resulted in placing sixteen 1¼-inch bolts in place of the six ¾-inch bolts, and even in this case the factor of rigidity of this joint was much less than that of its members. This example is not an outstanding exception, but illustrates a prevalent error in design made by many reputable manufacturers. "Look to your joints" would be a vaulable slogan for machine tool designers.

Take, for example, a lathe on which there are usually nine joining surfaces intervening between the stock and the tool edge. Some of these joints are fastened and some are free. Those that are free must be close fitting enough to hold vibration or chatter down to a minimum. Close fitting bearings resulting in metal to metal contact are essential to meet this re-

(*Concluded on Page* 886)

Iron Trade Review's Calendar of New Equipment

No.	Item	Builder	Comment	Date Described
233.	Milling head	Pratt & Whitney Co.	Internal milling attachment for thread miller	Sept. 13
234.	Arc welder	Fusion Welding Corp.	Portable; driven by gasoline motor	Sept. 13
235.	Magnetic contactor	Cutler-Hammer Mfg. Co.	Automatic control for lighting and power circuits	Sept. 13
236.	Blowers	P. H. & F. M. Roots Co.	Roller and ball bearings incorporated on all models	Sept. 13
237.	Regulating rheostat	Cutler-Hammer Mfg. Co.	Speed control for fractional-horsepower motors	Sept. 13
238.	Electric motor	General Electric Co.	Single phase repulsion induction type	Sept. 20
239.	Molding machines	Osborn Mfg. Co.	Portable types for medium size molds	Sept. 20
240.	Semisteel pulley	W. A. Jones Foundry & Machine Co.	High wearing qualities; suited for jerky load	Sept. 20
241.	Open-side planer	Cleveland Planer Co.	48-inch type designed to do work of 60-inch machines	Sept. 20
242.	Acetylene generator	Oxweld Acetylene Co.	Three sizes; 50, 100 and 300-pound carbide capacities	Sept. 20
243.	Cutting torch	Air Reduction Sales Co.	Improved high-pressure valve construction	Sept. 27
244.	Arc welder	Lincoln Electric Co.	Tractor-type; for lap or butt welding	Sept. 27
245.	Slip roll former	Niagara Machine & Tool Works	Will handle 22-gage metal	Sept. 27
246.	Coupling	T. L. Smith Co.	Full-floating flexible type for driveshafts	Sept. 27
247.	Truing fixture	Gleason Works	For truing circular cutters	Oct. 4
248.	Shaper	Cincinnati Shaper Co.	Wide range of speeds and cross feeds	Oct. 4
249.	Center lathe	Bullard Machine Tool Co.	Independent spindle and tools speeds at each station	Oct. 4
250.	Grinding wheel	Blanchard Machine Co.	Six abrasive segments clamped into chuck	Oct. 4
251.	Riveter	Chicago Pneumatic Tool Co.	Squeezes instead of hammers rivets into place	Oct. 4
252.	Electric drills	United States Electrical Tool Co.	Portable, high speed, ¼-inch type	Oct. 4
253.	Draw-cut shaper	Morton Mfg. Co.	High duty type; 32-inch stroke	Oct. 4
254.	Shape cutter	Linde Air Products Co.	Cuts with oxyacetylene blowpipe; automatic operation	Oct. 4
255.	Assembly press	Hanna Engineering Works	For use in chassis frame riveting installations	Oct. 4

Builds Device To Check Circular Cutters

No. 247

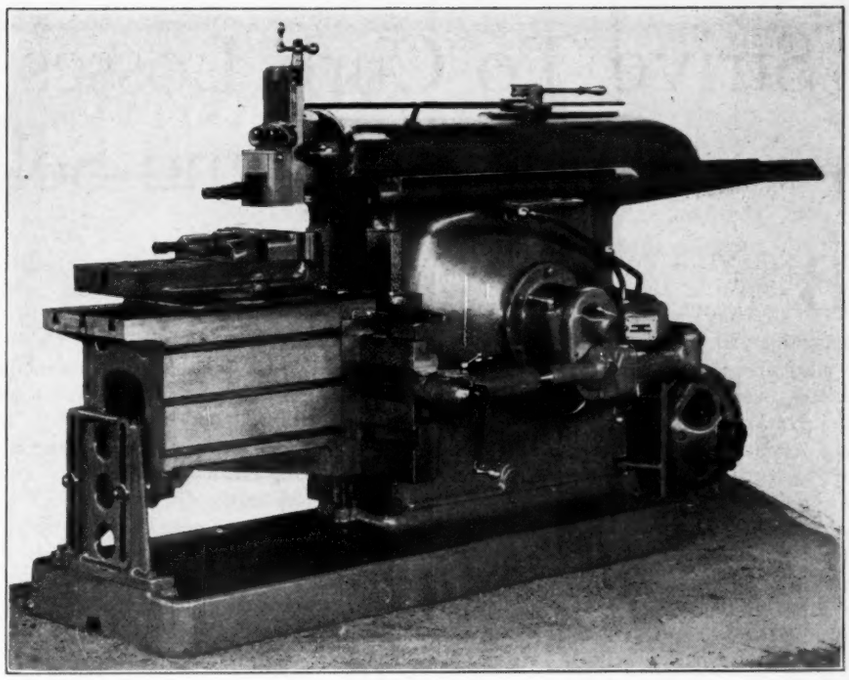
Gleason Works, 1000 University avenue, Rochester, N. Y., is placing on the market a new spiral cutter truing fixture for truing up the circular cutters used in connection with spiral bevel gear generators made by the same company. The device is said to provide a more accurate and convenient means for checking cutters which heretofore, in most cases, have been checked on the cutting machine. The fixture consists of a spindle made to accommodate the various sizes of cutters. A large handwheel, attached directly to the spindle is used for turning the cutter to the desired point for checking. Several different measuring instruments may be used in connection with the fixture and by the use of a finger device operated through a system of levers, one indicator is used for checking both the inside and outside cutting blades. The device is mounted on a rigid base, which is adjustable for height, as shown in the accompanying illustration.

Flexible Speed Control on New Shaper

No. 248

Cincinnati Shaper Co., Elam street and Garrard avenue, Cincinanti, has designed a new 36-inch rapid traverse shaper which is claimed to combine the speed and convenience of a small shaper with the strength and power of a large one. The machine, which occupies a floor space of 5 x 12 feet, has a variable speed of from 8 to 102 strokes per minute and a range of cross feeds from 0.010 to 0.170. Power rapid traverse to the table; automatic oiling; simple method of changing the cross feed; ease of changing speeds and making adjustments are features which the manufacturer claims cut the set-up time to a minimum. All control levers are located within a circle of 14 inches radius, an arrangement which is said to give ease and convenience to operation. The shaper is furnished either with a single pulley belt drive or, as shown in the accompanying illustration, with an integral electric motor drive.

No. 247—Cutter truing fixture



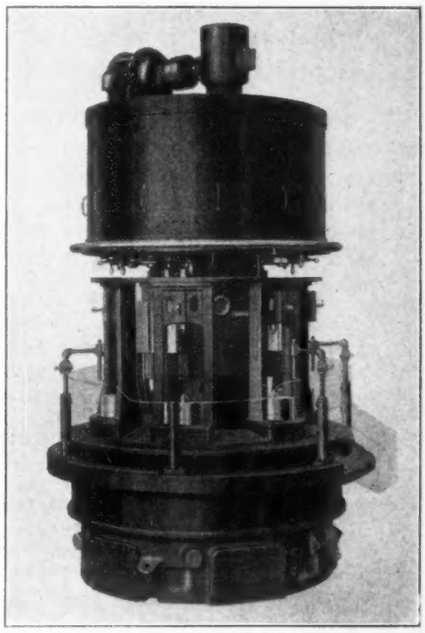
No. 248—Rapid traverse shaper of 36-inch type

Center Lathe Saves Time in Production Work

No. 249

Bullard Machine Tool Co., Bridgeport, Conn., recently has completed a new vertical turret lathe designed for use in the automotive and other quantity production metal cutting industries. The machine consists of six spindles capable of being operated simultaneously. Spindle speeds and tool feeds at each station are independent of the other stations and each speed and feed may be set to suit the requirements of the work at the respective station. A new application of turning between centers is embodied in the machine permitting the vertical turning of shaft jobs. A live center tail stock is mounted above between guides secured to the work spindle carrier and held in place by a steady ring, as shown in the accompanying illustration, and these tail stocks are adjustable for length of work up to 12 inches between centers. Clearance is provided for work up to 4 inches in diameter for the full length. The first station of the machine is without tool head and with spindle stopped for unloading and loading the work. Adjustment of individual speeds and feeds for each head is made by change gears on the individual feed works brackets in the upper compartment. The lathe is driven by a 10 horsepower motor running at 1800 revolutions per minute

(*Continued on Page* 885)



No. 249—Vertical turret lathe

Strive To Curb Losses Incurred in Buying and Selling

BELIEVING that lack of appreciation of the common interests of buyers and sellers is responsible for unnecessary losses to American industry, members of a committee working in co-operation with the National Association of Purchasing Agents have launched a campaign of education to reduce this waste. As a basis for action the committee, which met last Friday at the Commodore hotel, New York, unanimously adopted the proposed standards for buying and selling which are tabulated at the bottom of this page. It is hoped that by pointing out the tremendous burden thrust upon industry by ill-advised tactics of certain salesmen and purchasing agents, sentiment will be created which gradually will result in the adoption of more efficient practice.

The campaign is the outgrowth of a conference called by the National Association of Purchasing Agents in May to consider the responsibility of purchasing agents in the "profitless prosperity" era. As reported in the May 10 issue of IRON TRADE REVIEW, 23 representative manufacturers ,sales executives, purchasing agents and business paper editors attended this conference at the invitation of Chairman Lewis A. Jones. The consensus of opinion developed at this meeting was that "profitless prosperity" is a natural phase of a buyers' market, that "beating-down price" tactics and unscrupulous methods indulged in by some purchasing agents are not typical, that lack of price courage is a major contributing factor to "profitless prosperity," and finally that the most effective cure for existing conditions lies in the development of better understanding between sales and purchasing officials.

In resuming the thread of discussion at last Friday's conference, attention was directed to the fact that confidence should be the basis of successful selling. It was said that business deals conducted on the theory that "if I do not get him, he will get me," can only breed dissatisfaction. It was agreed that a vindictive attitude in buying or selling has no place in modern business.

Following a general discussion of practices which contribute to unjustified expense in sales, purchasing and distribution, members of the committee considered means of waging an educational campaign that will reach to all branches of industry. Appointment by the chairman of a committee to work out a definite plan was authorized.

Members of the committee who attended the conference on Friday were: Lewis A. Jones, New York Power & Light Co., Albany, N. Y., chairman; Roger W. Babson, Babson's Statistical Organization, Wellesley Hills, Mass.; L. F. Boffey, editor, *The Purchasing Agent*, New York; W. A. Marshall & Co., New York; W. W. Nichols, Machinery Builders' society. New York; G. A. Renard, secretary-treasurer, National Association of Purchasing Agents, New York; R. M. Roosevelt, Eagle-Picher Lead Co., New York; A. L. Salt, Graybar Electric Co., New York; A. M. Bowman, Humble Oil & Refining Co., Houston, Tex.; and E. L. Shaner, editor IRON TRADE REVIEW, Clveeland.

Proposed Standards for Buying and Selling

(PROPOSED BY THE NATIONAL ASSOCIATION OF PURCHASING AGENTS)

UNNECESSARY sales and purchasing expense is an economic waste—a tax on legitimate industry. Its elimination will assure satisfactory profits to the producer, economy to the consumer, and greater efficiency in commercial relations.

We recognize that the concern which buys must also sell, that buying and selling are companionate functions, that sound commercial transactions must be mutually profitable, and that co-operation between buyer and seller will reduce the cost of purchasing, sales and distribution with consequent benefits to industry as a whole.

In furtherance of these principles, we subscribe to the following standards in our buying and selling:

1. *To buy and sell on the basis of value, recognizing that value represents that combination of quality, service and price which assures greatest ultimate economy to the user.*
2. *To respect our obligations and neither expressly nor impliedly to promise a performance which we cannot reasonably expect to fulfill.*
3. *To avoid misrepresentation and sharp practice in our purchases and sales, recognizing that permanent business relations can be maintained only on a structure of honesty and fair dealing.*
4. *To be courteous and considerate to those with whom we deal, to be prompt and businesslike in our appointments, and to carry on negotiations with all reasonable expedition so as to avoid trespassing on the rights of others to the time of buyers and salesmen.*
5. *To avoid statements tending to injure or discredit a legitimate competitor, and to divulge no information acquired in confidence with the intent of giving or receiving an unfair advantage in a competitive business transaction.*
6. *To strive for simplification and standardization within the bounds of utility and industrial economy, and to further the development of products and methods which will improve industrial efficiency.*
7. *To recognize that character is the greatest asset in commerce, and to give it major consideration in the selection of customers and sources of supply.*
8. *To adjust claims and settle disputes on the basis of facts and fairness, to submit the facts to arbitration if a mutual agreement cannot be reached, to abide by the decision of the arbiters, and to resort to legal measures in commercial disputes only when the preceding courses prove ineffective.*
9. *To provide or accept no gifts or entertainment in the guise of sales expense, where the intent or effect is to unduly prejudice the recipient in favor of the donor as against legitimate competitors.*
10. *To give or receive no bribes, in the form of money or otherwise, in any commercial transaction, and to expose commercial bribery wherever encounterd for the purpose of maintaining the highest standard of ethics in American industry.*

Editorials

For Better Buying and Selling

IN UNANIMOUSLY adopting a statement of principles for buying and selling, a committee working in co-operation with the National Association of Purchasing Agents last Friday laid the foundation for a campaign to stamp out some of the abuses in the distribution of industrial materials and products. The proposed standards, which are presented on the opposite page, constitute a code of practice which if adopted and strictly adhered to by executives, salesmen and purchasing agents would reduce the cost of merchandising by a considerable margin.

Unfortunately this code—admirable though it may be as a clear-cut statement of principle—cannot be enforced. Like the codes of business ethics formulated, published and sponsored by the United States chamber of commerce and by numerous trade associations, it is merely a guide for approved practice. Its chief value lies in its latent power for inspiring executives to pitch their business conduct on a higher plane.

This power for constructive assistance to industry may be magnified many fold if the campaign based on the code is given the support it merits. Leaders in each branch of industry will do well to direct attention to the train of benefits that would follow general adherence to the code. By stressing the advantages of enlightened policies of buying and selling and by pointing out the possible gains in dollars and cents that would accrued to industry, support for the standard of principles can be won more effectively than by any direct appeal on the basis of ethics.

Unlike production, wherein tangibles are dealt with, merchandising never can be reduced to routine. However, the opportunities for increasing the efficiency of purchasing and sales effort are unlimited. If the proposed campaign cuts even a fraction from present costs, it will be well worth while.

The Drawback to "Making Your Own"

HOW far should manufacturing companies go in making their own materials or equipment, instead of buying them outside? There is evidence this tendency is increasing, though the practice has not attained the scope or importance that might be expected in view of the capabilities of some manufacturers to supply their own needs. Most companies prefer to take their chances in the market, and to benefit from the competition they find there. These competitors do not complain so much that business is being taken away from them as they do that they are being forced to take low prices. Manufacturers important enough to supply their own needs if necessary, are the ones who are in position to stir up competition among those who would sell to them. This fact removes the necessity for them to "make their own."

But another object now is receiving attention. One of the largest employing companies in the country announces an innovation in the form of a plant equipment department. This is a department "where employes transferred from various sections can be trained in diversified lines of work and help in the manufacture of equipment used in the works which has been formerly bought from outside vendors."

The purpose of this company is admirable—to keep its men employed. It is unusually alert in the interest of its employes, in their remuneration and general welfare. It wants to remove their worries, and keep them happily at work. However, there is another view of it. How about the fellows who may lose their jobs because they cannot make the equipment usually sold by their employers. Can they, too, turn to making something for their own shop? Isn't it a problem for employers larger than is represented in their own immediate situation?

Danger in Rapid Expansion

NOT less than 140 plants in the United States are at present engaged in the manufacture of airplanes, while a somewhat smaller number is producing airplane engines. This interesting information was revealed at an aeronautic session at the national meeting of the machine shop practice division of the American Society of Mechanical Engineers last week in Cincinnati. The extremely rapid growth of this young industry is attributed to the fact that compared with the cost of the product, a relatively small outlay for manufacturing equipment is required.

One new builder turned out one plane per day six weeks after starting business. At the end of two months his production had been increased to two planes daily and after three months five planes were being turned out every day. The department of commerce passes upon the de-

tails of design of all planes, but manifestly cannot supervise construction and therefore has no way of knowing that these details are carried out in the manufacturing process.

Obviously, an airplane builder seeking a lasting reputation will leave no stone unturned to develop a reliable product. The lure of large profits, however, will attract a few unscrupulous manufacturers whose greed for profits will outweigh their pride in craftsmanship. Fortunately, builders of this type cannot last long. A shoddy airplane, like a poor automobile, can be forced on a discriminating public for only a brief period.

Should Workers Have Two Trades?

SYSTEMATIC and directed shifts of workers from an overmanned to an undermanned industry may prove a means for curing some of the evils of unemployment. Coal mining seems to have too many miners the world over. It has created much of the difficulty in the United States, where apparently the effort of the miners is to keep wages sufficiently high to support a double shift, each working half time. England has transported a large number of surplus miners to Canada and most have relished the change. In the United States no such effort has been made and miners going to other employment have been relatively few.

In Germany, unemployment in the textile industries has been met in some degree by transferring men to agricultural pursuits. Present trends would indicate the desirability of workers having two or more trades, shifting from a crowded branch of industry to one where workers are needed. This would solve part of present difficulties among workers.

How far this can be aided by governmental means is difficult to say. Certainly the average worker is too independent to be sent hither and yon to restore balance, but economic pressure on the individual may bring about this result after present experiments have pointed the way.

Automobile Material Travels Far

DEMAND for freight service has been increasing rapidly the past few years. The average individual today requires 35 per cent more goods shipped to him for his personal wants than he did in 1911. In 1927 the class A railroads hauled 3613 tons of freight a distance of one mile for every man, woman and child in the country. This compares with an average of 2667 revenue ton miles for each inhabitant in 1911.

This growth in freight requirements is due in part to the increase in purchasing power of the individual combined with the lengthening list of necessities which follow our advancing civilization. The figure however is surprising in the face of the development of the automobile and truck. Yet these very items are responsible for a good proportion of the increase in railway freight service. All over the eastern part of the country automobile parts are being shipped in carload lots to Detroit and other midwest points and the finished auomobiles are usually shipped by rail to their distributing points.

If the transportation history of an automobile were traced back to the ore it would be found that in many cases this involves shipment by water and rail to Pittsburgh or Chicago, where steel is made, then shipment east into New York state and New England for manufacture into small parts such as ball bearings and crankshafts. These in turn are shipped back to Michigan for incorporation in larger automobile units which again are shipped to the distributing plant, or branch assembling plant of the automobile manufacturers.

The greatly reduced manufacturing cost made possible by large high production plants has offset the cost of transportation, and has made it economical for the man in Maine or California to have his automobile shipped by freight from the central part of the country.

What Our Readers Are Thinking

Purchasing by Railroads Is Spotty

To the Editor:

IN GLANCING through your issue of Sept. 20, I note on pages 716 and 717, "Only in rolling stock, however, is railroad participation in market deficient; demand for track accessories is good."

First, I do not know exactly what you include in "track accessories"; however, the frog and switch industry annually produces in normal times approximately 200,000 tons of material, and from the amount of business now being done, the demand for track accessories as far as the frog and switch business is concerned is certainly not good, but very poor.

It seems peculiar with so much general prosperity talked about, which includes the railroads, that there is not more buying of track equipment, but I believe the general situation, both as to rolling stock and track specialties, is anything but good.

"MANUFACTURER"

Sept. 21, 1928.

EDITOR'S NOTE: "Track accessories," as used in IRON TRADE REVIEW includes spikes, bolts, tie plates, splice bars, etc. Frogs and switches are considered as specialties. It is true that track accessories are in fair demand, whereas rolling stock and frogs and switches are not active at this time.

IRON TRADE REVIEW

Volume 83, Number 14 — Published Every Thursday

E. L. SHANER, Editor. — *J. D. PEASE, Advertising Director.* — *F. F. LIGHT, Circulation Manager.*

Industrial Spain Enriched with Mineral Treasures. Page 829

DURING his recent visits to Spain, including his attendance at the European foundry congress in Barcelona, Vincent Delport, European manager of IRON TRADE REVIEW, had unusual opportunities to obtain a great amount of official information about the iron and steel industry of that country. Mr. Delport knows Europe, its men and resources; he is constantly "on the job" for this publication. The data concerning Spain are so timely, authoritative and interesting that two articles are devoted to the subject, the first of which appears in this issue.

The Readers' Page

CONTENTS

For October 4, 1928

SPECIAL ARTICLES

Industrial Spain Enriched with Mineral Treasures—By Vincent Delport..... 829

Radiator Enclosures Offer Field for Use of Steel—By E. C. Kreutzberg..... 833

Size of Power Plant and Service Determine Use of Refractories—By R. A. Sherman..... 834

Metallography Simplified for Use in Shop—By E. Preuss..... 836

How Foundry Operates Extensive Research Laboratory—By C. W. Hamilton 838

Reviews of New Books..... 840

Machine Tools of Month..... 842

Strive To Cut Waste in Buying and Selling..... 844

Editorial..... 845

BUSINESS TREND

Car Loadings Now Above 1927—By John W. Hill..... 848

Freight Car Loadings 848
Employment Index. 849
Industrial Production..... 849
Steel Foreign Trade 850
Coke Production... 850
Detroit Employment 851
Building Costs..... 851

MARKET REPORTS

Review of Markets..... 852

Iron, Steel Prices..852, 853, 854, 857, 867, 894

Pig Iron..... 855
Iron Ore..... 856
Coke..... 856
Ferroalloys..... 856
Refractories..... 856
Iron and Steel Scrap 857
Semifinished..... 858
Bars..... 858
Plates..... 859
Pipe..... 860
Nuts, Bolts, Rivets.. 861
Sheets..... 861
Tin Plate..... 861
Structural Shapes.. 862
Reinforcing Bars... 863
Railroad Equipment 864
Cold Finished Steel. 864
Wire and Nails..... 865
Strip Steel..... 865
Nonferrous Metals.. 866
Coke By-Products.. 866
Warehouse Markets 867
Pacific Coast Markets..... 868
Foreign Markets.... 877
Machinery Markets 884
Crane Inquiry and Awards..... 884

GENERAL NEWS

Eleven More Blast Furnaces Make Iron 870

Mirrors of Motordom..... 873

Machine Shop Practice Engineers Hold Meeting..... 874

Industrial Men in the Day's News—I. Lamont Hughes..... 879

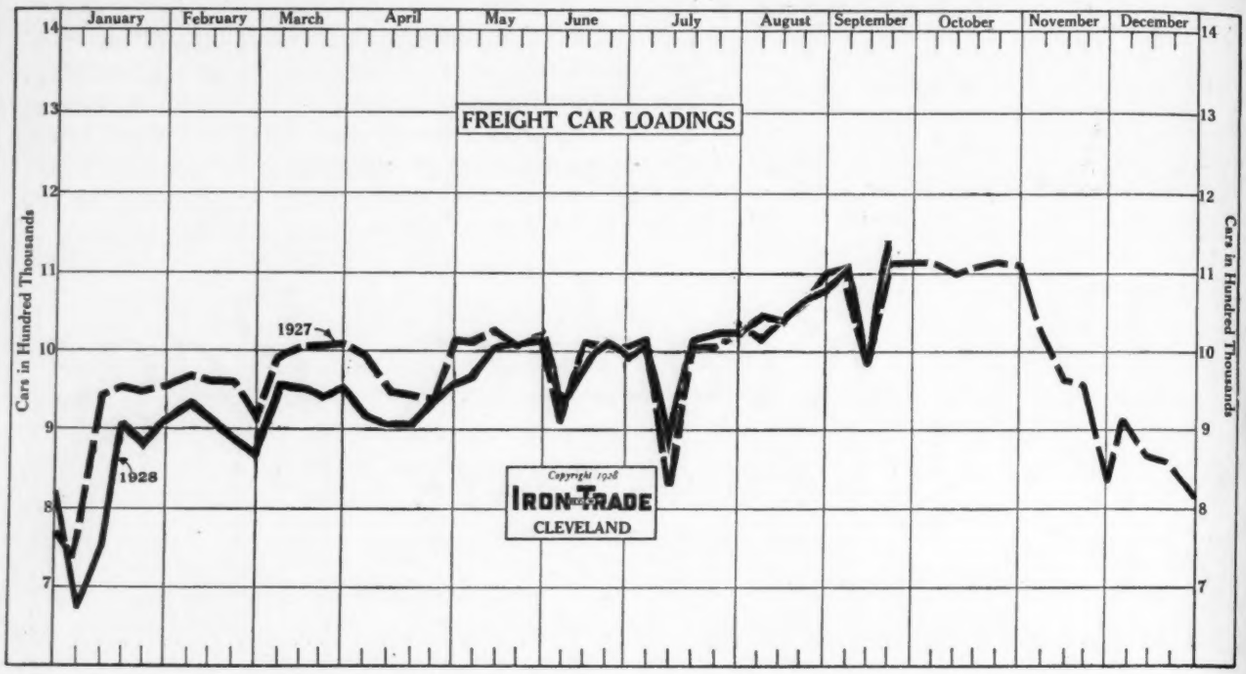
Exports Highest Since 1921..... 882

Here and There in Industry..... 871
Men of the Industry 880
Obituary..... 881
Construction and Enterprise..... 890
Trade Publications. 893

IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc.; and National Publishers Association. Branch offices: 1147 People's Gas Bldg., Chicago; 209 Edwards Bldg., Cincinnati; 2208-2206 No. 220 Broadway, New York; 2148-49 Oliver Bldg., Pittsburg; 24 California street, San Francisco; 1653 Pennsylvania avenue, Washington; and Boston. Foreign offices: Prince's Chambers, Birmingham, Eng.; Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Wilhelmstrasse 114, Berlin, S. W. 48, Germany; Cable address: *PENTON*, Cleveland; *IROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries £2:0:0 per year. *Entered at the Postoffice at Cleveland as Second Class Matter.* *Copyright 1928 by the Penton Publishing Co.*

The A. B. P. is a nonprofit organization whose members have pledged themselves to a working code of practice in which the interests of the men of American industry, trade and professions are placed first—a code demanding unbiased editorial pages, classified and verified paid subscribers and honest advertising of dependable products

The Business Trend



Car Loadings Now Above 1927

By JOHN W. HILL, Financial Editor

FREIGHT car loadings during 1928 have been running pretty consistently in arrears of the corresponding periods of 1927. For the year to date the cumulative total of freight movements shows a lag of about 3 per cent compared with one year ago. In all of the completed months except July declines from like months of 1927 are noted. Apparently, however, the tide has now turned.

IN THE week ended Sept. 15 car loadings totaled 1,138,312. This was a gain of 147,270 cars over the preceding week. It was an increase, moreover, of 10,669 over the corresponding week of 1927. In the preceding week also there was a gain over the first week of September last year. It is probable that freight movements will continue to gain.

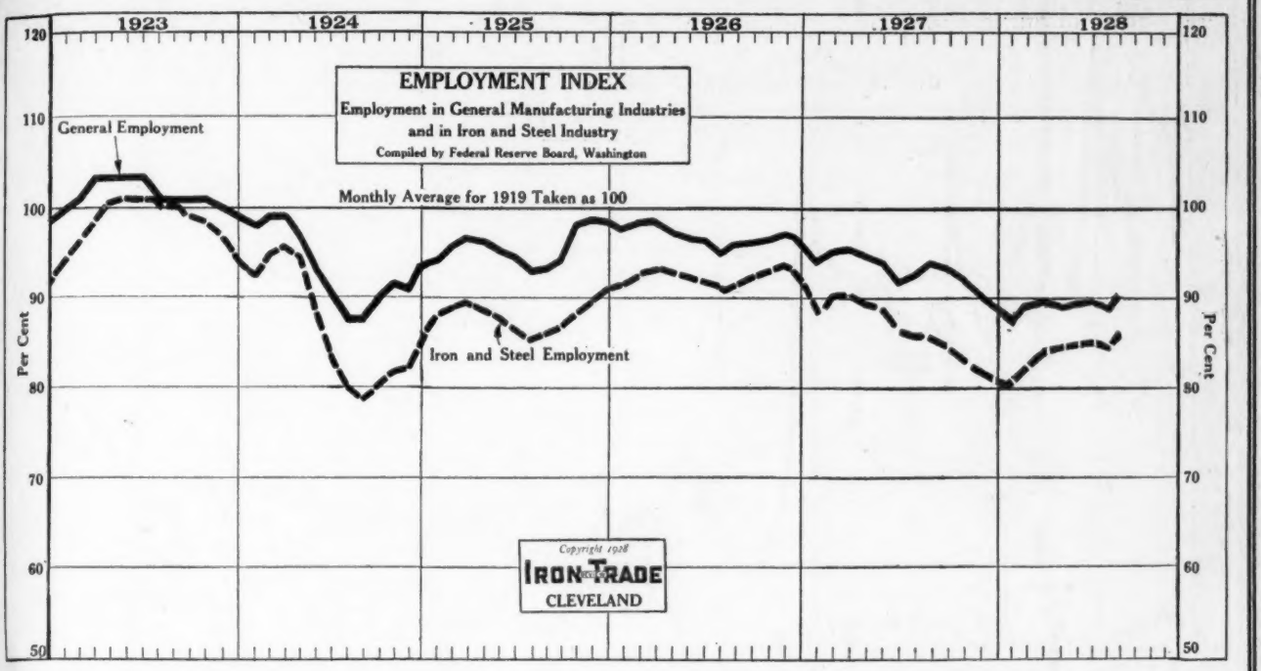
THIS is to be expected for two reasons. One is that agricultural production this year is larger than it was in 1927. The other reason is that industrial activities are greater. Not only is industry on a better level but its tendency during the last month has been upward, while one year ago it was definitely downward as business dipped into a slump.

THE decrease in car loadings this year is not an indication that trade and industry have been moving at a slower pace. Specifically it is accounted for by the decline for ore and coal shipments. The decrease in ore shipments is explained by the late opening of the lake season this year. Currently, ore shipments are high and prospects are for a big movement this year.

COAL shipments fell behind those of 1927, because of the tremendous spurt of coal output early in that year in preparation for the strike in April. Although the strike has been brought to a close there has been no great recovery in the coal industry. Miscellaneous freight movements for the year to date are slightly ahead of those of 1927, and well ahead of those of 1926.

INDUSTRIAL activities are being maintained at a high rate, with a number of lines lately depressed now joining in some degree at least in the improvement. Textiles are in this class. Moreover, the advance of autumn is giving seasonal stimulation to the distributive trades. A small falling off in automobile employment has appeared, but the total continues at a great record for this season.

The Business Trend

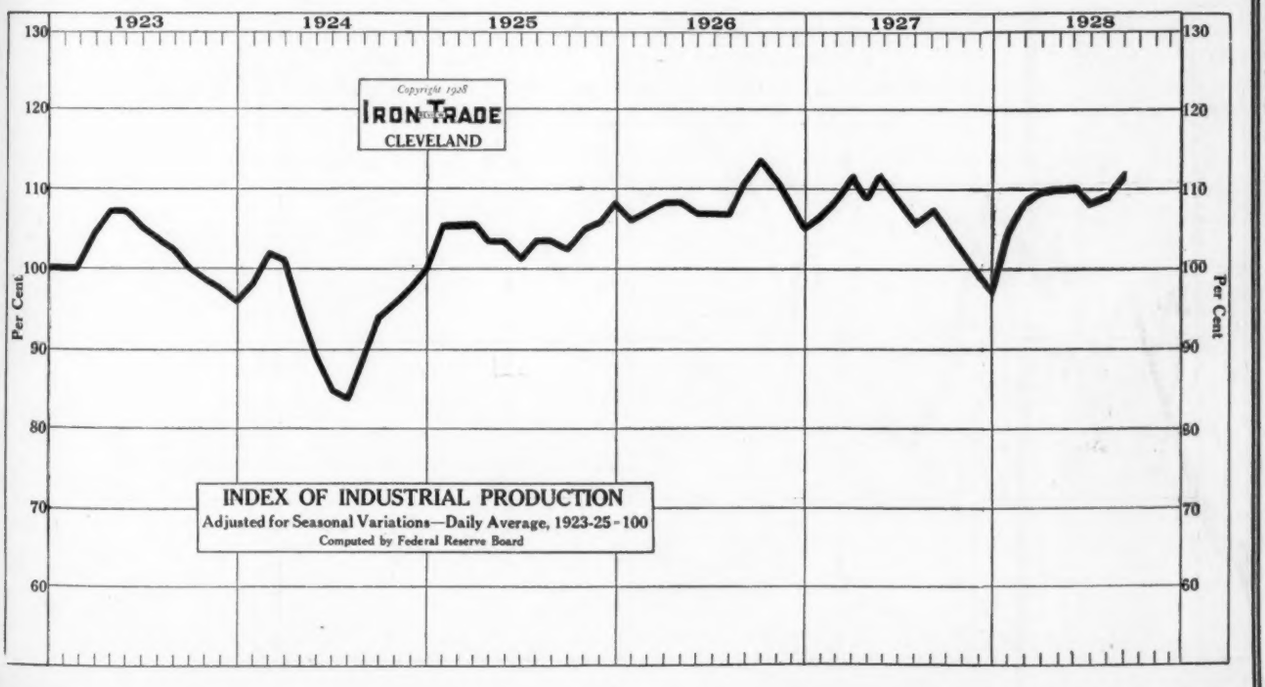


Employment Index

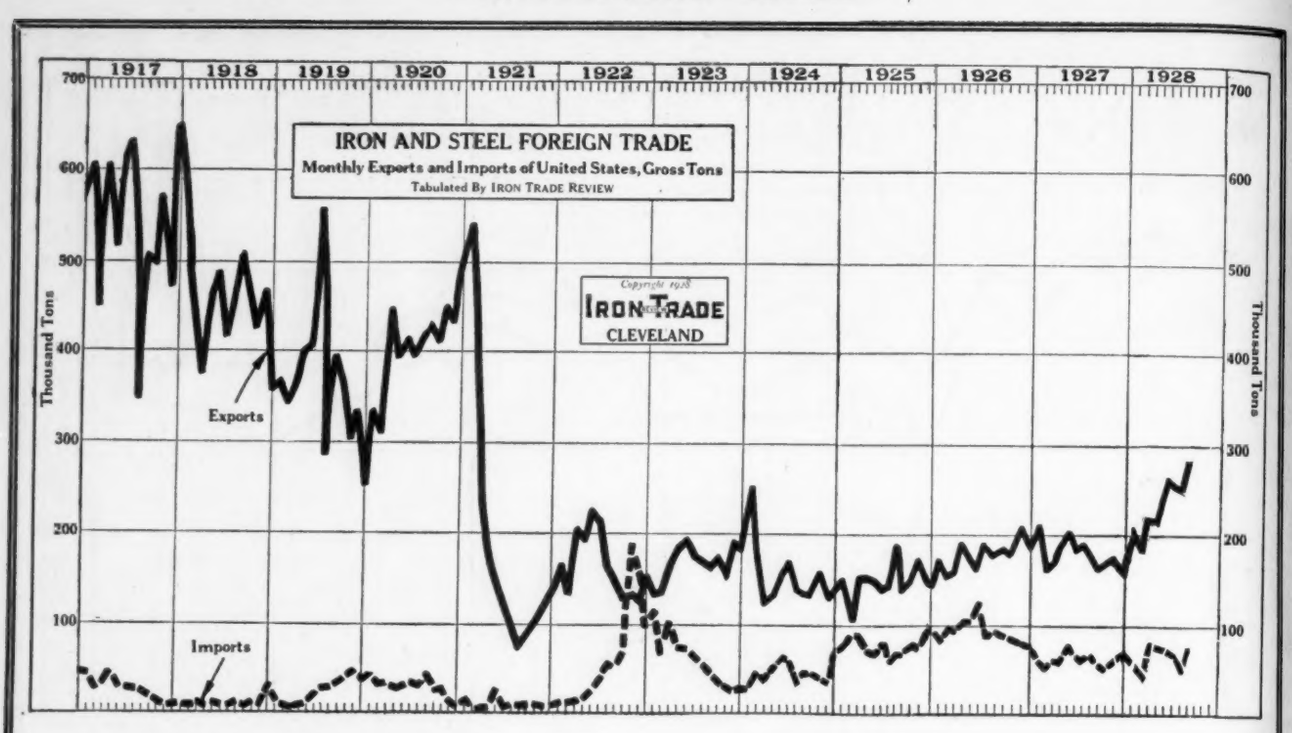
AS A result of the substantial improvement in industrial activities throughout nearly all important branches of manufacture, factory employment and pay rolls have materially increased since midsummer. In August they were close to the level of one year ago. In general industry the index, as computed by the federal reserve board, stood at 90 compared with 88.5 one month before. Iron and steel employment stood at an index of 86 compared with 84.6 one month before. It was higher than one year ago.

Industrial Production

THE production of both manufactures and minerals increased substantially in August, the output of manufacturing plants being larger than at this season of any earlier year. The index of industrial production as computed by the Federal Reserve board stood at 112 in August compared with 109 one month before and 108 one year ago. Automobile production made a record volume in August and information indicates that output was obtained by many producers at a high level during September.



The Business Trend

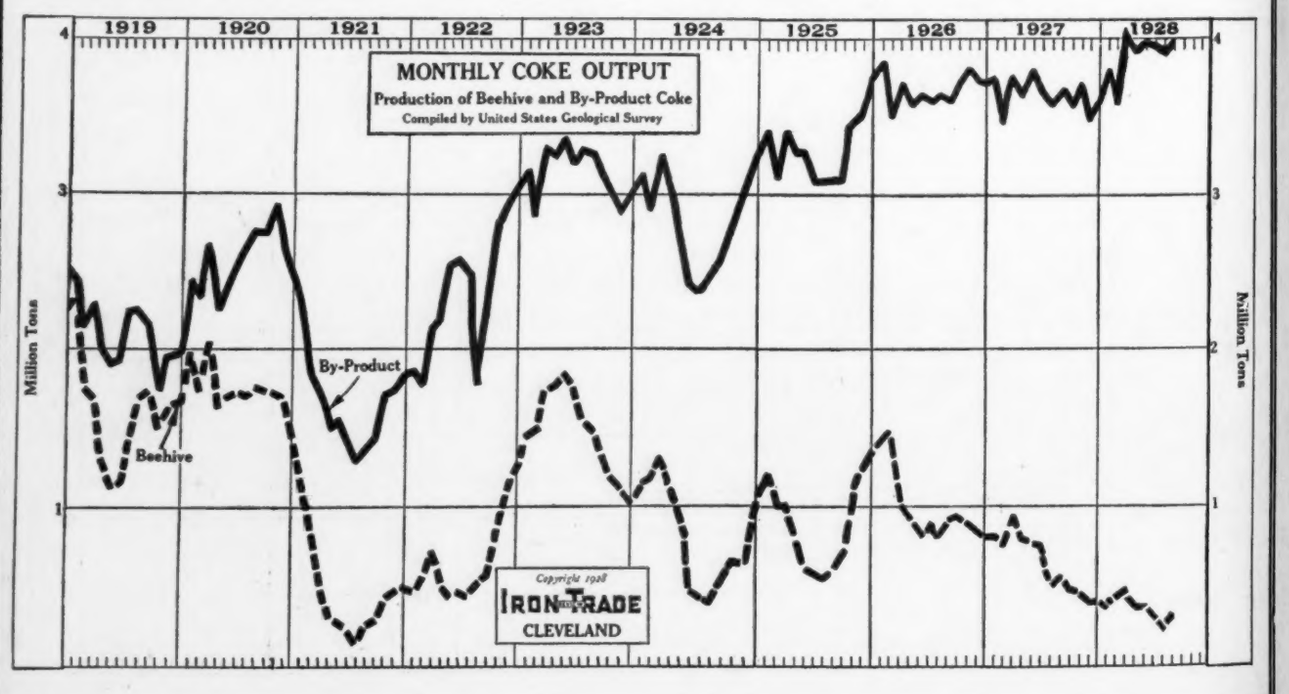


Steel Foreign Trade

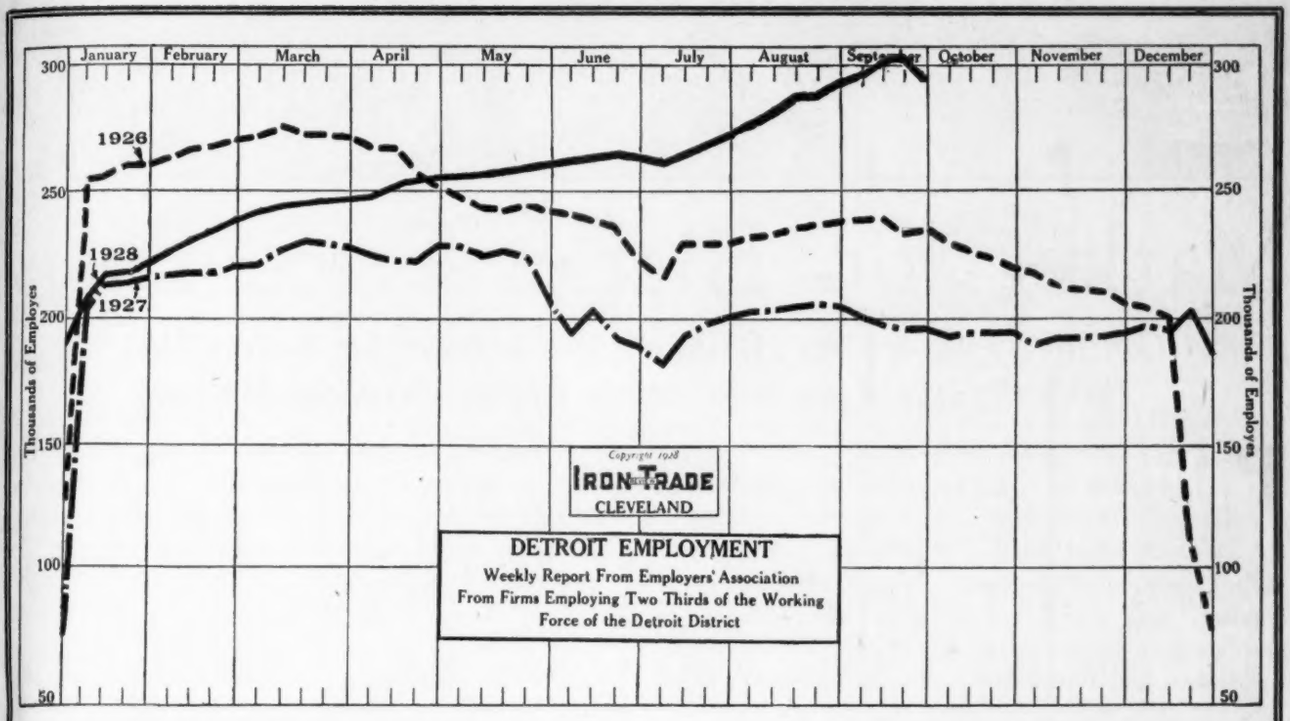
EVIDENCE of increasing industrial activity was found in both exports and imports of iron and steel for August. Exports of 287,297 tons for the month compared with 253,336 tons for the preceding month and 175,000 for the corresponding period of 1927. The month's total was the highest for any previous month since 1921. Imports of 69,914 tons compared with 47,830 tons in July and with 68,386 tons in August, 1927. Gains in exports of scrap and steel rails were particularly noteworthy in August.

Coke Production

PRODUCTION of by-product and beehive coke in August amounted to 4,282,924 tons, a daily average of 139,536 tons against 4,182,082 tons and a daily average of 137,000 tons in the preceding month. One year ago the total was 1,166,410 tons. During August the total production of by-product coke was 3,994,924 tons compared with 3,911,082 tons one month before. Beehive coke production stood at 288,000 tons against 271,000 tons in July. The proportion of beehive output continues small.



The Business Trend

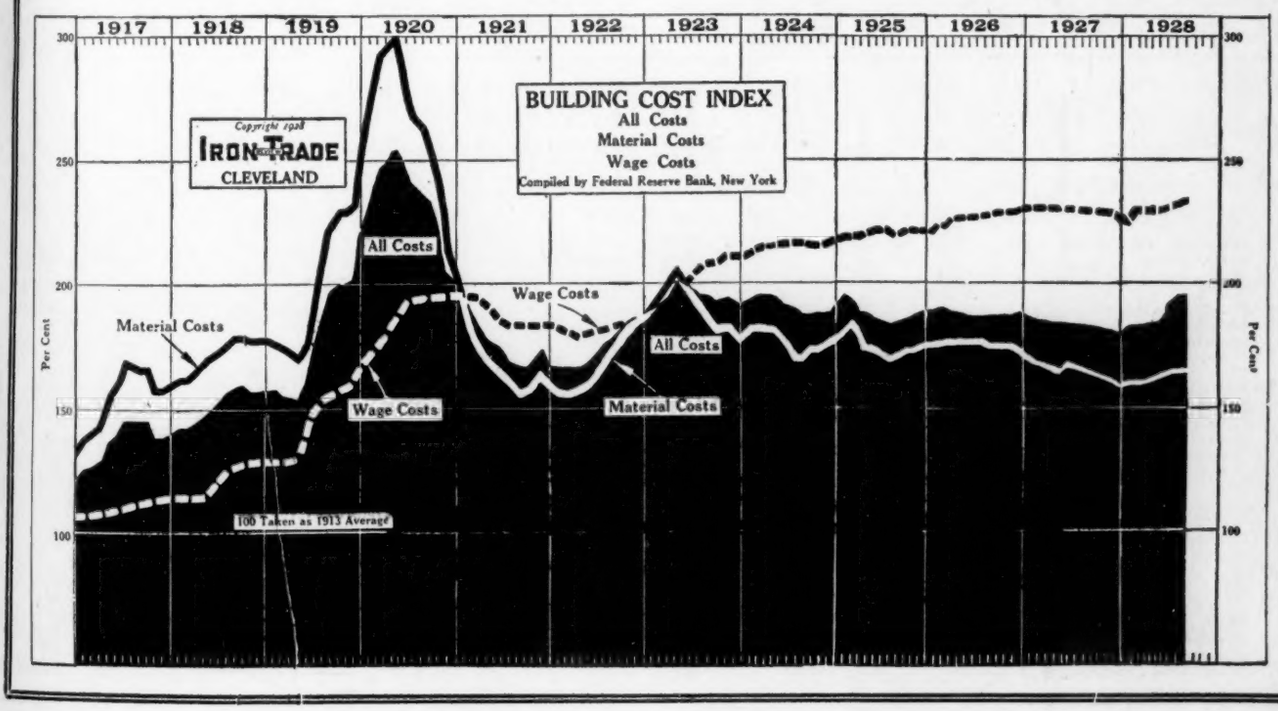


Detroit Employment

EMPLOYMENT in the Detroit manufacturing district for the week ended Sept. 25, registered the first decrease, following 11 consecutive weekly gains. During this period of rising employment the total entered new high ground for all time. The last reported figure was 297,537. This showed a decrease of 3186 workers compared with the preceding week. However, it stood 100,999 above the total for the corresponding week last year and was a new high record for that period in any year.

Building Costs

COSTS of building in August show practically no change from the preceding month. There was a small gain for wages of building labor with the index standing at 233 compared to 232 one month before. All costs of building stood at 191 compared with 191 one month before and material costs remained unchanged at 163. One year ago all costs stood at an index of 188 while materials stood at 161 and wages were at 229. Building labor is now receiving the highest wage in the history of the construction industry.



Markets on Higher Price Basis

Steel Consumers Show Less Hesitancy in Covering for Fourth Quarter—Daily Pig Iron Rate Increased—11 More Furnaces in Blast

PIG iron and steel enter the fourth quarter of the year on a higher price and production basis. Recent pig iron advances are being firmly established, while for finished steel the sustained volume of demand, absence of speculative buying, and directness with which material is moving into consumption, give the new prices real substance and foundation. Specifications on third quarter contracts are being rapidly worked out; most obligations will be completed by the middle of October. On all new business the higher fourth quarter figures are in effect. Some of the hesitancy among buyers noted recently is disappearing, and covering of requirements is proceeding with more speed.

Eleven More Stacks in Blast

Production of pig iron in September was augmented by the blowing in of 11 stacks, making 194 active Sept. 30. Output of coke pig iron in the 30 days amounted to 3,063,530 gross tons, against 3,137,995 tons in the 31 days of August, a loss of 74,465 tons. The daily output in September was 102,117 tons, 924 tons more than in August. September was the second consecutive month to show an improvement in the daily rate. The rate in September 1927 was 92,750 tons, and this figure was a drop from the August rate.

September shipments of pig iron exceeded those of August by 15 per cent or more, and were the largest of any month to date this year. Sales while continuing in good volume were not equal to those of August, marking the peak of the fourth quarter buying movement. Some large melters are asking for prices for first quarter, makers refusing to quote, or naming 50 cents over current figures. About 20,000 tons additional have been booked for shipment by barge from Buffalo to eastern districts before winter sets in. An Ohio steelmaker is reported to have closed on a portion of a 5000-ton inquiry for basic at $17, valley, and while this grade is scarcer, $16.50 has not disappeared. Production and shipments of Connellsville beehive furnace coke are expanding.

Sheet Mills Acquiring Backlogs

Activity in the sheet market is unusually brisk. Consumers are buying further ahead, as mill de-

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Oct. 3, 1928	Sept., 1928	July, 1928	Oct., 1927
PIG IRON				
Bessemer, del., Pittsburgh	$19.01	18.86	18.76	19.76
Basic, valley	16.50	16.10	15.95	17.00
Basic, eastern, del. eastern Pa.	19.00	19.00	19.00	19.50
No. 2 foundry, del., Pittsburgh	18.76	18.61	18.26	19.26
No. 2 foundry, Chicago	18.50	18.30	17.60	18.75
*Southern No. 2, Birmingham	16.25	16.25	15.50	17.25
*Southern Ohio, No. 2 Ironton	19.00	19.00	19.00	19.00
**No. 2X, Virginia furnace	20.50	20.50	20.50	21.50
**No. 2X, eastern, del. Phila	21.26	21.01	20.76	20.66
Malleable valley	17.25	17.10	17.00	17.50
Malleable, Chicago	18.50	18.30	17.60	18.75
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del. Pittsburgh	18.26	18.01	18.76	18.76
Ferromanganese, del. Pittsburgh	109.79	109.79	109.79	94.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.75	2.75	2.60	2.85
Connellsville, foundry, ovens	3.75	3.75	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	33.00	33.00	33.00	34.00
Sheet bars, open-hearth, Pittsburgh	33.00	33.00	32.25	34.00
Billets, open-hearth, Pittsburgh	32.00	32.00	32.25	33.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.50

	Oct. 3, 1928	Sept., 1928	July, 1928	Oct., 1927
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.95	1.90	1.85	1.75
Steel bars, Chicago	2.00	2.00	2.00	1.85
Steel bars, Philadelphia	2.27	2.22	2.17	2.07
Iron bars, Chicago	2.00	2.00	2.00	1.90
Shapes, Pittsburgh	1.95	1.90	1.85	1.75
Shapes, Philadelphia	2.11	2.06	2.01	2.07
Shapes, Chicago	2.00	2.00	2.00	1.85
Tank plates, Pittsburgh	1.95	1.90	1.85	1.75
Tank plates, Philadelphia	2.15	2.10	2.10	2.07
Tank plates, Chicago	2.00	2.00	2.00	1.85
Sheets, black, No. 24, Pittsburgh	2.70	2.65	2.65	2.95
Sheets, blue anl., No. 10, Pittsburgh	2.00	2.00	2.00	2.15
Sheets, gal., No. 24, Pittsburgh	3.50	3.50	3.50	3.80
Sheets, black, No. 24, Chicago	2.90	2.85	2.80	3.10
Sheets, blue anl., No. 10, Chicago	2.15	2.15	2.15	2.35
Sheets, galvanized, No. 24, Chicago	3.65	3.65	3.65	3.95
Plain wire, Pittsburgh	2.40	2.40	2.45	2.40
Wire nails, Pittsburgh	2.55	2.55	2.55	2.55
Tin plate, per base box, Pittsburgh	5.25	5.25	5.25	5.30
SCRAP				
Heavy melting steel, Pittsburgh	17.00	16.55	14.10	14.50
Heavy melting steel, eastern Pa.	15.75	14.65	12.75	14.00
Heavy melting steel, Chicago	13.25	12.95	12.30	11.75
No. 1 wrought, eastern Pa.	15.50	15.10	15.25	15.75
No. 1 wrought, Chicago	13.25	12.95	12.30	11.40
Rails for rolling, Chicago	16.25	15.90	14.50	14.70

Current Prices for Rolled Steel Products

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED

STEEL PLATES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.15c to 2.25c
New York, del.	2.225c to 2.325c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, delivered	2.09c to 2.19c
Buffalo	2.00c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.20c to 2.30c

STRUCTURAL SHAPES

Pittsburgh	1.90c to 2.00c
Philadelphia, del.	2.11c
New York, del.	2.19c to 2.24c
Boston, del.	2.265c to 2.415c
Chicago	2.00c
Cleveland, delivered	2.09c to 2.19c
Buffalo	2.00c
Birmingham	2.15c
Pacific Coast, c.i.f.	2.35c

BARS

SOFT STEEL

Pittsburgh	1.90c to 2.00c
Chicago	2.00c
Birmingham	2.15c
Lackawanna, N. Y.	2.05c to 2.10c
Pacific Coast, c.i.f.	2.35c
Cleveland	1.90c to 2.05c
Philadelphia, del.	2.27c to 2.32c
New York, delivered	2.29c to 2.34c
Boston, delivered	2.265c to 2.415c
Pittsburgh, cold finishing	2.05c
Pittsburgh, forging quality	2.15c

RAIL STEEL

Chicago Heights	1.90c to 1.95c
Eastern mills	1.85c

IRON

Chicago	2.00c
New York, delivered	2.14c to 2.24c
Philadelphia, delivered	2.12c to 2.22c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pittsburgh billet, cut lengths	2.25c
Stock lengths from mill	2.00c
Chicago, billet	2.30c to 3.00c
Chicago, rail steel	2.00c to 2.60c
Chicago, rail steel, road and bridge work	1.85c to 1.95c
Philadelphia	2.47c to 2.57c

COLD FINISHED STEEL

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Shafting (turned, polished) Pittsburgh	2.20c
Shafting (turned, ground) mill (Depending on size, 1 3/16 to 7-inch)	2.55c to 3.00c
Cold finished steel bars, Cleve.	2.25c

TIN AND TERNE PLATE

Prices per 100-pound box Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.00c to 4.10c

*Price subject to quantity differentials.

SHEETS

SHEET MILL BLACK

No. 24, Pittsburgh base	2.65c to 2.75c
No. 24, Philadelphia, delivered	3.07c
No. 24, Gary, Lndiana Harbor	2.85c
No. 24, Chicago, delivered	2.90c
No. 24, Birmingham, base	2.90c

TIN MILL BLACK

No. 28, Pittsburgh, base	2.90c
No. 28, Gary, base	2.95c to 3.00c

GALVANIZED

No. 24, Pittsburgh, base	3.50c to 3.60c
No. 24, Philadelphia, delivered	3.82c
No. 24, Gary, Indiana Harbor	3.60c
No. 24, Chicago, delivered	3.65c
No. 24, Birmingham, base	3.65c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.00c
No. 24, Philadelphia, delivered	2.32c to 2.42c
No. 10, Gary, Indiana Harbor	2.10c
No. 10, Chicago, delivered	2.15c
No. 10, Birmingham, base	2.15c

*Plus 0.10 cents for 45 inches or wider.

AUTOMOBILE

No. 20, Pittsburgh, base,	4.00c

FURNITURE

No. 24, Grade A, Pittsburgh	3.85c to 3.90c
No. 24, Grade B, Pittsburgh	3.65c to 3.70c

(*Turn to the following page*)

liveries become more deferred. On some of the ordinary finishes shipment cannot be made short of three to four weeks, ranging to ten weeks on certain grades. The leading interest in Pittsburgh is producing at 90 per cent; Youngstown district independents at 89 per cent, while Chicago output is at the peak rate of the year. New business is going on the books at an advance of $2 a ton over third quarter for blue annealed, black and galvanized. Opposition to the reduced cash discount rate is gradually subsiding.

Heavy Structural Tonnage Pending

A survey of structural projects in the East and West which now are in the market or will come in during the fourth quarter shows approximately 425,000 tons of structural work ahead, not including projects of less than 1000 tons. Current awards are more numerous, mill schedules generally are being filled up, with deliveries beginning to be extended. Awards include 15,000 tons, added to 45,000 tons previously placed, for the Chicago merchandise mart; 9500 tons for two jobs in Pittsburgh, and others involving 1000 to 5000 tons. An Asheville, N. C., silk company is in the market for 6000 to 10,000 tons. Featuring the market for reinforcing bars is an award of 1400 tons for an automobile service station in New York. Plate specifications were heavy in the last week of September, and new business is increasing in volume, with good prospects for continued improvement. A moderate revival in western oil tank requirements is noted, with inquiries from the Pacific coast for 8000 tons of plates, following awards in the week amounting to more than 3000 tons. New York pipe line projects now in the market call for over 15,000 tons of plates. Four eastern railroads are negotiating for fourth quarter requirements. Demand for steel bars is holding up, Chicago mills working at capacity, and production in the Pittsburgh district at the highest rate of the year.

More Rail Requirements Developing

Further inquiries for rails are developing, following distribution of orders for more than 100,000 tons as a result of purchases a week ago. The Chicago, Burlington & Quincy's orders for 30,000 tons is expected to be placed this month. Canadian National railways have entered the market for 15,000 tons, and also 1500 box cars, 43 coaches and 30 tank cars. This interest placed 35 locomotives.

Several substantial orders for seamless steel pipe for oil well casings have been booked for export.

Steel corporation units are operating at an average of 86 per cent this week, compared with 84 per cent a week ago. Independents average also slightly higher at 85 per cent. A year ago the corporation units were operating at around 69 per cent, and the independents at 63 per cent. IRON TRADE REVIEW'S composite of 14 leading iron and steel products is $35.30 this week, compared with $35.29 a week ago.

Composite Market Average

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Oct. 3, 1928)	$35.30
Last week (Sept. 26, 1928)	35.29
One month ago (September, 1928)	35.19
Three months ago (July, 1928)	34.91
One year ago (October, 1927)	35.67
Ten years ago (October, 1918)	57.53
Fifteen years ago (October, 1913)	24.91

Current Rolled Steel Prices

PRICES IN CENTS PER POUND UNLESS OTHERWISE INDICATED
SEE ALSO PRECEDING PAGE

HOOPS, BANDS, STRIPS

Hot strip, under 3-inch, Pitts. 2.10c to 2.20c
Hot strip, 3 to 6-inch, Pitts. 2.00c to 2.10c
Hot strip, 6 to 12-inch, Pitts. 1.80c to 1.90c
Hot rolled strip, 12 to 24-inch 16 gage and heavier, coils or cut lengths, 1.90c plate basis, or 2.00c blue annealed basis.
Hot strip, bands, under 3-in. Chicago 2.30c
Hot strip, bands, 3 to 6-in., Chi. 2.20c
Hot strip, bands, 6 to 12-in., Chi. 2.00c
Hot strip, 12 to 24 in., Chi.... 2.10c
blue annealed sheet basis.
Cold rolled strip, hard coils, 16 inches and wider by 0.100-inch and heavier, base Pitts., Cleve., (3 tons and over)..... 2.75c to 2.85c
Worcester, Mass. (3 tons and over) ..... 3.00c to 3.10c
Quantity extras: 5999 to 2000 pounds, 0.25c; 1999 to 1000 pounds, 0.65c.

ALLOY STEEL

Hot Rolled
F.o.b. Mills
Alloy Quality Bar Base is 2.75c

S.A.E. Series Number	Alloy differential	Net, 100 lb. bars
2000	0.25	$3.00
2100	0.55	3.30
2300	1.50	4.25
2500	2.25	5.00
3100	0.55	3.30
3200	1.35	4.10
3300	3.80	6.55
3400	3.20	5.95
4100 0.15-0.25 Mo.	0.50	3.25
4100 0.25-0.40 Mo.	0.70	3.45
4600 0.20-0.30 Mo. 1.25-1.75 Ni.	1.05	3.80
5100 0.60-0.90 Cr.	0.35	3.10
5100 0.80-1.10 Cr.	0.45	3.20
5100 Chrome Spring	0.20	2.95
6100 Bars	1.20	3.95
6100 Spring Steel	0.95	3.70
Chrome Nickel Vanadium..	1.50	4.25
Carbon Vanadium	0.95	3.70
9250	0.25	3.00

TUBING

Boiler
Carload Discounts—Less-carloads 4 points Lower—F.o.b. Pittsburgh Mills
Steel 3¼ to 3¾-inch 42½
Charcoal iron, 3¼ to 4½-inch 9
Seamless hot rolled 3¼ to 3½-inch.... 56
Further discounts of six 5 per cents for 21,000 pounds or more on lap welded steel. On charcoal two 10's and one 2½ on 12,000 pounds or more.

COLD DRAWN SEAMLESS
F.o.b. mill in desirable quantities
Random length over 5 feet .....55 per cent
Selected lengths, 1 to 18 feet .....53 per cent

WIRE PRODUCTS

To Jobbers in Carloads
F.o.b. Cleveland and Pittsburgh base
Dealers 10 cents per 100 pounds extra

Bright plain wire, No. 9 gage.. 2.40c
Annealed fence wire 2.55c
Galvanized wire, No. 9 gage.... 3.00c
Barbed wire, painted 2.95c
Barbed wire, galvanized 3.20c
Per 100 lbs.
Wire nails $2.55
Galvanized nails, plus differ. 4.55
Polished staples 3.00
Galvanized staples 3.25
Coated nails, 100 lb. kegs, Sept. 1, 1926 extras apply.... 2.55
Woven wire fencing (retailers) 12½ gage, 26-in. high, 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts $20.03
Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

CAST IRON WATER PIPE

Prices per net ton
Class B Pipe

Six-inch and over, Birming'm $34.00 to 35.00
Four-inch, Birmingham ..... 38.00 to 39.50
Four-inch, Chicago ..... 46.20 to 47.20
Six-inch to 24-inch, Chicago..... 42.20 to 43.20
Four-inch, New York ..... 40.50 to 41.60
Six-inch and over, New York 37.60
Standard fittings, Bir. base..... $100.00
Six to 24-inch base; over 24-inch; plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $4 higher than Class B.

IRON AND STEEL PIPE

Base Discounts Pittsburgh and Lorain, O., to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel*	62	50½
1 to 1½-inch butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less.
*To large jobbers these discounts are increased on black by 1 point and a supplementary discount of 5 per cent on galvanized by 1½ points with a supplementary 5 per cent.

CHAIN, PILING, CUT NAILS

Cut nails, c.l., f.o.b. mills..... 2.70c
Cut nails, l.c.l. f.o.b. mills..... 2.80c
Chain, 1-in., proof coil, Pitts.... 6.00c
Sheet piling base, Pittsburgh.. 2.25c

RAILS, TRACK MATERIAL

Standard bessemer rails, mill $43.00
Standard open-h'th rails, mill $43.00
Relaying rails, St. Louis.....$24.00 to 31.00
Relay rails, Pitts. 60 to 90 lb...$22.00 to 27.00
Light rails, 25 to 45, mills..... $36.00
Angle bars, Chicago base..... 2.75c
Spikes, railroad, Pittsburgh.... 2.80c
Spikes, small railroad, 7/16-inch and smaller, Pitts..... 2.80c
Spikes, boat and barge, Pitts. 3.00c
Spikes, railroad, Chicago 2.80c
Track bolts, Pitts., steam roads 3.80c
Track bolts, Pitts., stand, jobbers .....70 off list
Track bolts, Chicago 3.80c
Tie plates, Chicago, Pitts..... $43.00

BOLTS AND NUTS

Birmingham and Chicago
Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.
Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS
All sizes, cut thread .....60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Eagle list ..... 60 to 70 off

MACHINE BOLTS
All sizes, cut thread ..... 60 to 70 off
Rolled thread ⅝x6 and smaller take 10 per cent lower list.
Lag screws ..... 60 to 70 off
Plow bolts, Nos. 1-2-3-7 heads 60 to 70 off
Tap bolts ..... 60 to 70 off
Blank bolts ..... 60 to 70 off
Stud bolts without nuts ..... 60 to 70 off
Stove bolts, 75, 20, 10 and 5 off in pkgs., 75, 20, 10 and 5 with 2½ off in bulk.
Tire bolts .....60-5 off

Nuts
Semifinished .....60 to 70 off

HEXAGON CAP SCREWS
Milled .....80-10-10 off
Upset 1 in. diam. and smaller.....85-5 off

SQUARE HEAD SET SCREWS
Milled .....80-10 off
Upset 1 in. diam. and smaller.....80-10-10 off

RIVETS

Struct., c.l., Pitts.-Cleve..... 2.80c to 2.90c
Structural, c.l., Chicago 3.00c
**7/16-inch and smaller, Pitts.....70 and 10 off
Chi., Cleve. .....70 to 70 and 10 off
**Some makers quoting 70 off with freight allowed on 300 pounds or more.

WASHERS

Wrought, c.l., Pitts. dist.....$6.50 to 6.75 off
Wrought, c.l., Chicago dist.....$6.70 to 6.90 off
Lock: To dealers .....85-5 off
Lock: To consumers .....85 off

Raw Materials and Semifinished Products

SEMIFINISHED MATERIAL

Prices Per gross ton

BILLETS AND BLOOMS
4 x 4-inch base

Pittsburgh, open-hearth .....$33.00 to 34.00
Pittsburgh, bessemer ..... 33.00 to 34.00
Youngstown 32.00
Cleveland 33.00
Philadelphia 33.30
Chicago 33.00
Forging, Chicago 38.00
Forging, Pittsburgh 38.00
Forging, Philadelphia 43.30

SHEET BARS
Pittsburgh $33.00
Youngstown 33.00
Cleveland ..... 32.50 to 33.00
Chicago 34.00

SLABS
Pitts., Young., and Cleve.....$33.00 to 34.00

WIRE RODS
Pittsburgh, Cleveland $42.00
Chicago 45.00

SKELP
All grades, Pittsburgh ..... 1.85c to 1.90c

IRON ORE

LAKE SUPERIOR ORE
Per Gross Ton, Lower Lake Ports

Old range bessemer, 51½% $4.55
Mesabi bessemer, 51½% 4.40
Old range nonbessemer 41½% 4.40
Mesabi nonbessemer, 51½%..... 4.25

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63% 8.00
Copper free low phosphorus 58 to 65 per cent ..... nominal

FOREIGN ORE
Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-8% manganese.. 10.50 to 11.00
North African low phosphorus 10.00 to 11.00
Swedish foundry or basic, 65%—none offered
Spanish and North African basic, 50 to 60 per cent ..... 8.50 to 9.00
Newfoundland foundry, 55%.... 8.50

MANGANESE ORE

Prices do not include duty of 1 cent per pound of metallic manganese contained.
Brazilian .....36 to 38 cents
Indian .....35 to 38 cents
Caucasian (53-55 per cent) ....38 to 40 cents

FLUORSPAR

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton....$16.50 to 17.00
Washed gravel, imported duty paid, east, tidewater, net ton $15.25 to 15.75

REFRACTORIES

FIRE CLAY BRICK
Per 1000 f.o.b. works

First Quality
Pennsylvania .....$43.00 to 46.00
Ohio ..... 43.00 to 46.00
Illinois ..... 43.00 to 46.00
Kentucky ..... 43.00 to 46.00
Missouri ..... 43.00 to 46.00
Maryland ..... 43.00 to 46.00
Georgia and Alabama ..... 40.00 to 45.00

Second Quality
Pennsylvania ..... 35.00 to 38.00
Ohio ..... 35.00 to 38.00
Illinois ..... 35.00 to 38.00
Kentucky ..... 35.00 to 38.00
Missouri ..... 35.00 to 38.00
Maryland ..... 35.00 to 38.00
Georgia and Alabama ..... 30.00 to 35.00

SILICA BRICK
Pennsylvania 43.00
Joliet, Ill., East Chicago, Ind.... 52.00
Brimingham ..... 50.00 to 51.00

MAGNESITE BRICK
Per Net Ton
9 x 4½ x 2½ 65.00

MAGNESITE
Net Ton Chester, Pa., and Baltimore base
Dead-burned grain magnesite.... 40.00

CHROME BRICK
Net Ton Chester, Pa., and Baltimore base
9 x 4½ x 2½ 45.00

Pig Iron

Melters Showing Interest in First Quarter Prices—Market Active and Firm—Basic Iron Scarce, and Stronger

INQUIRIES for pig iron for first quarter of 1928 are increasing in number and size, and while interest was restricted to one or two districts a week ago it now has become fairly general. About 15,000 tons is pending at Cleveland, while Cincinnati reports an inquiry for 5000 tons of malleable for first quarter. Most furnace interests are declining to quote, while others are naming prices 50 cents higher than their current figures. The market continues active and firm. Furnaces are reducing stocks. Consumption in eastern district now exceeds production. September pig iron shipments were the largest of any month this year; for the Chicago district they were 15 per cent larger than in August. Basic iron is scarcer, and part of a 5000-ton inquiry reported placed.

PITTSBURGH, Oct. 2.—The basic pig iron market is enlivened by more inquiry, and lack of substantial supplies. One Ohio steelworks is understood to have closed on part of a 5000-ton inquiry at $17, valley. Three other mills are negotiating for additional supplies. A local steel foundry is seeking 1000 tons. The need for basic output of some mills for their own requirements in some cases is forcing them to withdraw from the market, and certain merchant furnaces have none to offer, with the result supplies are scarce. Foundry iron still is moving in lots of five carloads and less at a time, with sellers generally receiving $17, base, valley. The rate of melt shows a slight increase. Small sales of bessemer are being made at $17.50, valley, and $17.25, valley, is considered minimum on malleable. Sellers usually are able to command $18.25, delivered, for gray forge iron.

The average sales price of basic iron in September was $16.50, compared with $16 in August, according to data compiled by W. P. Snyder & Co. The average for bessemer iron in September was $17.195, against $17 in August.

Boston, Oct. 2.—Pig iron sales in the past week totaled less than 3000 tons. The Mystic Iron Works booked 1800 tons. Prices continue firm. Mystic was able to obtain on at least one tonnage 75 cents above the price quoted a fortnight ago. A few sales of Indian iron are noted at $21.25 to $21.75, on dock, duty paid.

Buffalo, Oct. 2.—Small-lot buying is the rule in this market but aggregate bookings are good and shipments are heavy. Nothing is offered for Buffalo district delivery below $17.50 for this quarter and $18 for next. The Hanna Furnace Co.'s new stack began producing iron this week, making 11 stacks in operation in the district. Furnaces expect to ship about 20,000 tons of iron by barge canal before navigation closes.

New York, Oct. 2.—Although the larger portion of pig iron requirements in this district are on the books of the producers, new demands keep cropping out. These are restricted, as a rule, to lots of 300 tons or less, but they comprise a fair total in the aggregate. On this business the advanced prices are being done, namely, $17, base, Buffalo, and $20, base, eastern Pennsylvania furnaces. The melt among foundries in this territory is increasing and specifications for shipment on contracts are brisk. Consumption of iron in the East now is in greater volume than the current production. Buffalo and eastern furnaces have nearly liquidated the large stocks of foundry iron which they had at the beginning of the year and there has been no increase in production, so it is expected some additional capacity will have to be placed in blast in the near future. For some time past the only foundry iron from abroad which has commanded a ready sale in the United States has been Indian and Dutch iron which have been sold consistently at premiums over the domestic iron. The European market has advanced slightly, and there does not seem to be any possibility of increasing the volume of pig iron imports under present market conditions.

Youngstown, O., Oct. 2.—While No. 2 foundry pig iron appears to be available in the valley in fair size lots, basic and bessemer grades do not seem so plentiful. However, basic iron can be had around $16.50 to $16.75, valley furnace, although one important producer with little if any to sell has set its basic price at $17, valley furnace. It also is asking $18, valley, for bessemer. No. 2 foundry is holding steadily at $17, valley. The inquiry for 5000 tons of basic put out by a central Ohio steelmaker has found little response as yet from those furnace interests which have received it here.

Cleveland, Oct. 2.—Substantial inquiries for pig iron for delivery in the first quarter of 1929 are being received by furnace interests with headquarters here. Several sellers have requests for prices on various lots aggregating 10,000 to 15,000 tons, a good share of which comes from the automotive industry. Makers hesitate to quote; some mention prices 50 cents above present levels, while others decline to name any figures. The market continues to show strength, and fairly active buying for fourth quarter. Sales booked here in the past week totaled 26,000 tons, compared with 37,000 tons in the week preceding. All furnace interests report September shipments exceeded those of August, except one which was unable to ship all the iron called for. September sales, however, fell short of those of August, when the buying movement was at its peak. For one merchant furnace interest, September sales were approximately two-thirds those of the preceding month. A Cleveland producer, the only one now in the market for fourth quarter, continues to quote $17.50, base, furnace, for outside shipment and $18, base, for delivery in the local 50-cent switching area. The market in western Ohio, southern Ohio and Indiana

(*Concluded on Page* 869)

Pig Iron Prices

Per Gross Ton

Bessemer, valley furnace	$17.25 to 17.50
Bessemer, del. Pittsburgh	19.01 to 19.26
Basic, valley furnace	16.50 to 17.00
Basic, del. Pittsburgh	18.26 to 18.76
Basic, Buffalo furnace	17.00
Basic, del. eastern Pa.	19.00 to 19.25
Malleable, valley furnace	17.25 to 17.50
Malleable, del. Pittsburgh	19.01 to 19.26
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	18.00
Malleable, del. eastern Pa.	20.50 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. 1X, eastern del., Phila.	21.76
No. 1X, Buffalo furnace	19.00
No. 2 foundry, valley furnace	17.00
No. 2 foundry, del. Pittsburgh	18.76
No. 2 plain, Buffalo furnace	17.50
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 plain, del., Phila.	20.76
No. 2 plain, Virginia furnace	20.00
No. 2 plain, N. J., tidewater	20.01 to 21.28
No. 2 Alabama, Birmingham	16.25
No. 2 Alabama, del. Cincinnati	19.94
No. 2 Tenn., Birmingham base	16.25
No. 2 Tenn., del. Cincinnati	19.94
No. 2 Alabama, del. Chicago	22.26
No. 2 Alabama, del. Cleveland	22.51
No. 2 Alabama, del. St. Louis	20.67
No. 2X, east, N. J., tidewater	20.51 to 21.78
No. 2X, eastern, del. Phila.	21.26
No. 2X, foundry, Buffalo furnace	18.00
No. 2X, eastern, del. Boston	20.91 to 21.41
No. 2X, Virginia furnace	20.50
Gray forge, val., del. Pittsburgh	18.26
Low phos., standard, valley	26.50
Low phos., standard, Phila	24.26 to 24.76
Low phos. copper bearing fur.	23.00 to 23.50
Charcoal, Birmingham	28.00
Charcoal, Superior, del., Chicago	27.04

CANADIAN PRICES

No. 2 foundry, del. Toronto	23.60
No. 2 foundry, del. Montreal	25.00
Malleable, del. Toronto	23.60
Malleable, del. Montreal	25.00
Basic, del. Montreal	24.00

Silvery iron, Jackson county (Ohio) furnace in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents: 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Coke

Demand Increases, but Not Enough to Affect Prices—Connellsville Production Up

SEASONAL influences are stimulating need for coke in some districts. Demand for beehive furnace fuel has improved silghtly, and production has been increased. Some furnace interests are renewing arrangements for fourth quarter. Spot beehive furnace coke continues $2.75, and foundry fuel $3.75, minimum, while by-product coke prices continue unchanged for October.

Pittsburgh, Oct. 2.—The beehive coke market shows some improvement in demand compared with the situation a month ago, although the upturn is slow, and prices have not been effected. Shipments on contracts are heavier in some instances and production has been increased accordingly. The Jones & Laughlin Steel Corp. has been taking ten carloads of furnace coke daily since late in July and will continue this arrangement this month. The Davison Coke & Iron Co. started to take coke for its Sharpsville furnace Oct. 1. Little change is noted in demand for foundry coke, while purchases of heating coke are increasing slowly. Spot buying generally is light, with $2.75 generally minimum for furnace coke and $3.75 minimum for foundry coke fuel.

Production of coke in the Connellsville region for the week ended Sept. 22 was 36,490 tons, as compared with 32,850 tons the preceding week, according to the *Connellsville Courier.*

Boston, Oct. 2.—Local ovens are running behind in production of foundry and domestic coke. Orders have come to producers in better volume than for some time. Domestic sizes have been advanced 50 cents a ton in the Greater Boston district. Foundry coke prices are unchanged.

Buffalo, Oct. 2.—Foundry coke is moving more freely. A good outlook for this quarter is reported. Prices are steady.

Detroit, Oct. 2.—By-product foundry coke continues to move out mostly in single carloads to foundries at $8.50, ovens. Nobody is contracting ahead. Domestic demand is taking precedence in total tonnage shipped daily, the recent cold weather being immediately reflected in numerous calls for fuel. One shipper stated that out of 135 carloads shipped in one day recently only five went to foundries.

Cincinnati, Oct . 2.—The price of founury coke is unchanged, and this grade is in strong demand. It is reported Birmingham sellers have placed considerable tonnage in Indiana at $3 and less.

St. Louis, Oct. 2.—Production of by-product coke in this district shows a moderate gain, due to seasonal influences. Specifying on metallurgical grades during the final week of September decreased slightly. There has been no effort thus far to accumulate stocks of foundry coke against cold weather requiremets. Shipments of industrial coke continue in large volume.

Birmingham, Ala., Oct. 2.—Better conditions are noted in the coke market. Production is unchanged. By-product foundry coke is firm at $5, base, Birmingham.

Coke Prices

Prices per Net Ton

Beehive Ovens	
Connellsville furnace	$2.75 to 3.00
Connellsville foundry	3.75 to 4.85
New River foundry	6.50 to 7.00
New River furnace	6.50
Wise county foundry	4.50 to 5.25
Wise county furnace	3.75 to 4.25
By-Product Foundry	
Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham	5.00
Indianapolis, del.	8.25
Ashland, Ky.	7.00
Portsmouth, O.	7.00
Detroit, ovens	8.50
Buffalo, ovens	9.00

Ferroalloys

Shipments Continue Heavy—September Tonnage Gains Over August

Pittsburgh, Oct. 2.—Ferroalloy shipments to consumers in this district continue active. The total tonnage for September showed a gain over the August rate and was substantially larger than a year ago. Current contracts will run until the end of the year, so that no change in price in ferromanganese is anticipated at this time. Specifications for spiegeleisen have been in line with blast furnace operations and generally have been larger than 30 days ago. Spot transactions for all ferroalloys are light. Ferromanganese continues $105 a ton, duty paid, seaboard, with 50 per cent ferrosilicon quoted at $83.50 in car lots. Spiegeleisen continues at $33 for 19 to 21 per cent.

New York, Oct. 2.—Consumption of ferromanganese is at an increased rate in this country and consumers generally are specifying more actively against their second half contracts. Certain producers who had accummulated considerable tonnage of this metal report that these stocks are being reduced as a result of increased shipments. Although English producers recently announced an increase £1 in their export price on ferromanganese, it is believed that the advance is restricted to the continent, inasmuch as no change in prices has been noted here. In selling to the United States the English producers as a rule quote the same price as our domestic makers. The present price is unchanged at $105, duty paid, tidewater. There is some talk about increasing this price for the first half of next year but it still is too early for any serious action in this direction. American producers failed to get any portion of the 500 tons of ferromanganese and 200 tons of ferrosilicon on which the Imperial Steel Works of Japan recently took bids. The business went to European makers. Demand for shipments on spiegeleisen contracts also is improved. A good volume of spot sales of this metal continues to be made at $33 furnace for the 19 to 21 per cent.

Special ferroalloys are moving freely, due to the high operations of steel mills. Practically all business is against old contracts, and prices are unchanged.

Chicago, Oct. 2.—Contract shipments of ferromanganese and ferrosilicon are good. A carload of ferromanganese was sold at $105, seaboard.

Iron Ore

Lake Movement Close to 1927—Large Gain in September Shipments

IRON ORE PRICES, PAGE 854

Cleveland, Oct. 2.—Lake Superior iron ore shipments by vessels in September totaled 8,748,286 tons, an increase of 1,518,245 tons, or 21 per cent over the shipments in September, 1927. The total lake movement this season to Oct. 1 amounts to 41,265,979 tons, 1,117,978 tons, or 2.64 per cent less than the tonnage in the comparable period of 1927. Some reports indicate the total movement this year will approximate or exceed that of last year, based on recent increases in shipping instructions.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent tidewater, duty paid	$105.00
Ferromanganese, del. Pittsburgh	109.79
Spiegeleisen, 19 to 21 per cent domestic furnace	33.00
*Ferrosilicon, 50 per cent, freight allowed, carloads	83.50
*Do., less carload	88.50
Do., 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Do., for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	96.00
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala. (24 per cent)	122.50

*These prices contract; spot $5 higher.

Scrap

Advance of Prices Continues—Scarcity Develops in Some Grades—Trading Is Cautious

IRON and steel scrap prices continue to advance on scarcity and unwillingness of dealers to obligate themselves far in the future. Railroad offerings of the present week are expected to clear the situation somewhat. Consumers continue to resist present quotations.

Chicago, Oct. 2.—No sign of a break in the upward trend of the iron and steel scrap market is evident. Most dealers are holding material for still higher prices. Dealers and brokers are reluctant to book fresh orders while scrap is being held back. Actual scarcities exist in certain grades. Railroad malleable has advanced another 50 cents, jumping $1 a ton in the past ten days. No. 1 railroad wrought and short rails each are 25 cents higher on actual consumer sales, these grades being difficult to obtain. Heavy melting steel has advanced another 25 cents to $13.25 to $13.75. Dealers have been paying more than $13.75, and it is reported small selected lots were sold to consumers at above $14, gross, delivered. An important consumer is seeking a large tonnage, and it is understood leading sellers are holding out for $14.

New York, Oct. 2.—Scrap dealers here have advanced prices on No. 1 railroad steel to $11.50 to $12, New York, and on foundry stove plate to a range of $9.25 to $9.75. These prices follow substantial buying by consumers at West Mahwah, Bayonne

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except Detroit where dealers' buying prices are shown

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$10.00 to 10.75
Boston, dealers	10.25 to 10.75
Buffalo, No. 1	15.00 to 16.00
Buffalo, No. 2	13.00 to 13.50
Chicago	13.25 to 13.75
Cincinnati, deal.	12.50 to 13.00
Cleveland, No. 1	13.50 to 14.00
Cleveland, No. 2	13.00 to 13.50
Detroit, No. 1	12.00 to 12.50
Eastern Pa.	15.50 to 16.00
Eastern Pa. No. 2	12.50 to 13.50
Bethlehem deliv.	14.00
N. Y., deal., R. R.	11.50 to 12.00
N. Y., deal., yd.	8.00 to 9.00
Pittsburgh, No. 1	16.50 to 17.00
St. Louis, No. 1	12.50 to 13.00
St. Louis, No. 2	12.00 to 12.50
Valleys, No. 1	15.00 to 15.50

COMPRESSED SHEETS

Buffalo	13.50 to 14.00
Chicago	11.75 to 12.25
Cleveland	13.00 to 13.50
Detroit	12.00 to 12.50
Pittsburgh	16.50 to 17.00
Valleys	15.00 to 15.50
E. Pa. new mat.	13.00

BUNDLED SHEETS

Buffalo	10.50 to 11.00
Cincinnati, deal.	10.00 to 10.50
Cleveland	12.00 to 12.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	14.25 to 14.75
St. Louis	8.00 to 8.50

SHEET CLIPPINGS, LOOSE

Chicago	7.50 to 8.00
Cincinnati	9.25 to 9.75
Detroit	8.00 to 8.50
St. Louis	8.00 to 8.50

STEEL RAILS, SHORT

Birmingham	10.50 to 11.00
Boston	8.25 to 8.75
Buffalo	16.00 to 16.50
Chicago	17.00 to 17.50
Cincinnati, deal.	17.00 to 17.50
Detroit	14.50 to 15.00
St. Louis	15.75 to 16.25

STOVE PLATE

Birmingham	12.00 to 12.50
Boston consumers	10.00
Buffalo	13.75 to 14.25
Chicago, net	11.50 to 12.00
Cinn., deal., net	9.00 to 9.50
Cleveland	9.00 to 9.25
Detroit, net	10.75 to 11.25
Eastern Pa.	12.50 to 13.00
N. Y., deal., mill	8.25 to 8.75
Pittsburgh	11.50 to 12.00
St. Louis	12.00 to 13.00

SHOVELING STEEL

Chicago	13.25 to 13.75
Pittsburgh	12.50 to 13.00
St. Louis	12.50 to 13.00

KNUCKLES, COUPLERS SPRINGS

Buffalo	16.00 to 16.50
Chicago	15.50 to 16.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	18.50 to 19.50
St. Louis	14.00 to 14.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.00 to 16.50
Cincinnati, deal.	13.50 to 14.00
Eastern Pa.	17.50 to 18.50
Pitts. billet and bloom crops	20.00 to 20.50
Cleve. billet and bloom crops	17.00 to 17.50

FROGS, SWITCHES, GUARDS

Chicago	15.00 to 15.50
St. Louis	13.50 to 14.00

ANGLE BARS—STEEL

Buffalo	14.00 to 14.50
Chicago	16.50 to 17.00
St. Louis	13.00 to 13.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	9.00 to 9.50
Buffalo, No. 1	11.50 to 12.00
Buffalo, No. 2	14.75 to 15.25
Chicago, No. 1	13.25 to 13.75
Chicago, No. 2	13.25 to 13.75
Cinn., No. 2	12.50 to 13.00
Eastern Pa.	15.00 to 16.00
N. Y., No. 1 deal.	11.00 to 11.50
Pittsburgh, No. 1	13.50 to 14.00
Pittsburgh, No. 2	16.50 to 17.00
St. Louis, No. 1	11.50 to 12.00
St. Louis, No. 2	12.50 to 13.00

WROUGHT PIPE

Boston, dealers	9.00 to 9.50
Eastern Pa.	14.00 to 14.50
Buffalo	12.00 to 12.50
New York, deal.	10.25 to 10.75

YARD WROUGHT

Boston	8.00 to 8.50
Eastern Pa.	15.00 to 15.50

BUSHELING

Buffalo	13.50 to 14.00
Chicago, No. 1	11.00 to 11.50
Chicago, No. 2	8.50 to 9.00
Cinn., No. 1 deal.	11.00 to 11.50
Cinn., No. 2	6.50 to 7.00
Cleveland, No. 2	10.25 to 10.50
Detroit, No. 1	10.50 to 11.00
Detroit, mixed	7.25 to 7.50
St. Louis, No. 1	10.00 to 10.50

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.50
Buffalo	8.50 to 9.00
Chicago	7.50 to 8.00
Cincinnati, deal.	8.50 to 9.00
Cleveland	9.00 to 9.50
Detroit	8.00 to 8.50
Eastern Pa.	11.50
New York, deal.	7.00 to 8.00
Pittsburgh	11.25 to 11.75
St. Louis	7.00 to 7.50

MIXED BORINGS, TURNINGS
For blast furnace use

Boston, dealers	6.00 to 6.50
Buffalo	10.00 to 10.50
Cincinnati, deal.	9.00 to 9.50
Cleveland	10.25 to 10.50
Detroit	8.50 to 9.00
Eastern Pa.	10.00 to 10.50
New York, deal.	6.25 to 6.75
Pittsburgh	12.50 to 13.00

CAST IRON BORINGS

Birmingham, chem.	13.00 to 13.50
Birmingham, plain	8.00 to 9.00
Boston, chem	9.50 to 10.00
Boston, dealers	6.00 to 6.50
Buffalo	10.00 to 10.50
Chicago	10.25 to 10.75
Cincinnati, deal.	9.00 to 9.50
Cleveland	10.25 to 10.50
Detroit	8.50 to 9.00
Eastern Pa.	11.00 to 11.50
Eastern Pa., chem.	14.50 to 15.00
New York, deal.	6.75 to 7.25
Pittsburgh	12.50 to 13.00
St. Louis	9.50 to 10.00
Valleys	12.50 to 13.00

PIPE AND FLUES

Chicago, net	8.50 to 9.00
Cincinnati, deal.	8.25 to 8.75

RAILROAD GRATE BARS

Buffalo	11.75 to 12.25
Chicago, net	12.25 to 12.75
Cincinnati	9.50 to 10.00
Eastern Pa.	12.50 to 13.00
New York, deal.	8.00 to 8.50
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston, dealers	8.50 to 9.00
Buffalo	12.50 to 13.00
Chicago	9.00 to 9.50
Cleve., over 10 in.	12.00 to 12.50
Detroit	10.00 to 10.50
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston, dealers	6.00 to 6.50
Chicago	16.50 to 17.00
Eastern Pa.	11.50 to 12.50

ARCH BARS AND TRANSOMS

Chicago, net	20.50 to 21.00
St. Louis	18.25 to 18.75

Iron, Steel Works Scrap

AXLE TURNINGS

Boston, deal	6.75 to 7.00
Buffalo	11.50 to 12.00
Chicago	11.00 to 11.50
Cleveland	12.50 to 13.00
Eastern Pa.	12.00 to 13.00
Pittsburgh	15.00 to 15.50
St. Louis	9.50 to 10.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston, ship point	15.50 to 16.00
Buffalo	17.50 to 18.00
Chicago	18.50 to 18.75
Cleveland	16.00 to 16.50
Eastern Pa.	20.00 to 21.00
Pittsburgh	18.50 to 19.00
St. Louis	18.00 to 18.50

SHAFTING

Boston, ship point	14.00 to 14.50
Chicago	17.35 to 17.90
Eastern Pa.	20.00 to 21.00
New York, deal.	15.00 to 16.00
St. Louis	17.00 to 17.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	12.00 to 12.50
Boston, con.	14.00 to 14.50
Buffalo, iron	13.00 to 13.50
Buffalo, steel	16.00 to 16.50
Chicago, iron	13.00 to 13.50
Chi., rolled steel	17.00 to 17.50
Cincinnati	12.50 to 13.00
Eastern Pa., cast	16.50 to 17.00
Eastern Pa. rolled	17.00 to 17.50
N. Y., iron, deal.	12.50 to 13.00
Pittsburgh, iron	15.50 to 16.00
Pittsburgh, steel	17.50 to 18.00
St. Louis, iron	13.00 to 13.50
St. Louis steel	15.50 to 16.00

No. 1 CAST SCRAP

Birmingham, cup.	13.00 to 13.50
Buffalo	15.00 to 15.50
Boston, textile	15.50 to 16.00
Buffalo	14.25 to 14.75
Chicago, mach.	16.50 to 17.10
Chicago, railroad	15.95 to 16.50
Chicago, agri.	14.30 to 14.85
Cincinnati, mach. cupolas, net deal.	15.00 to 15.50
Cleveland, cupola	16.00 to 16.50
Detroit, net	12.25 to 12.75
Eastern Pa. cupola	16.25 to 17.00
N. Y., cup., deal.	13.00 to 13.50
Pittsburgh, cupola	14.25 to 14.75
San Fran., del.	20.00 to 21.00
Seattle	15.50 to 15.75
St. Louis	13.00 to 13.50
Valleys	16.50 to 17.00

HEAVY CAST

Boston	10.50 to 11.00
Buffalo, breakable	12.00 to 12.50
Cleve., breakable	12.25 to 12.75
Detroit, auto., net	18.00 to 19.00
Eastern Pa.	16.50 to 17.00
New York, deal.	12.50 to 13.00
Pittsburgh	13.00 to 13.50

MALLEABLE

Boston, railroad	13.50 to 14.50
Buffalo	15.50 to 16.00
Chicago, agri.	13.00 to 13.50
Chicago, railroad	15.00 to 15.50
Cinn., R. R., deal.	12.50 to 13.00
Cinn., agri., deal.	12.00 to 12.50
Cleveland, agri.	15.00 to 15.50
Cleveland, rail.	15.00 to 16.00
Detroit, auto	14.50 to 15.00
Pittsburgh, rail.	14.00 to 14.25
St. Louis, rail	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	10.50 to 11.00
Boston, dealers	9.50 to 10.50
Buffalo	14.75 to 15.25
Chicago	16.25 to 16.75
Eastern Pa.	14.50 to 15.00
New York	10.50 to 11.00
Pittsburgh district	16.50 to 17.00
St. Louis	14.50 to 15.00

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	16.00 to 16.50
St. Louis, No. 1	12.25 to 12.75

LOW PHOS. PUNCHINGS

Chicago	15.50 to 16.00
Pittsburgh	17.00 to 17.50

and Boonton, N. J. Stronger tone in railroad steel finds source in recent heavy purchases by a Coatesville, Pa., consumer at $16, delivered. A substantial tonnage of turnings has recently been purchased by a Conshohocken, Pa., consumer.

Boston, Oct. 2.—Activity developed in the scrap market during the past week. Eastern Pennsylvania mills began taking materials and Pittsburgh resumed buying. Prices ruled firm generally. Except for wrought grades other materials were in good demand.

Philadelphia, Oct. 2.—Fair activity in iron and steel scrap is made up of moderate lots. Prices on some grades tend higher. Foundries have bought cupola cast at $16.50 to $17, delivered, and a steel mill is paying $16.25 for this grade. Two mills have paid $3.50 for No. 2 melting steel and dealers are paying up to $13.25.

Pittsburgh, Oct. 2.—Large tonnages of heavy melting steel scrap are understood to have been bought by two mills in this district, with $17 applying. Consumer buying generally has been quiet, most activity confined to dealers covering old orders. Strength in steel specialties has been a feature, $19 reported to have been paid on recent transactions in knuckles and couplers, railroad coil and leaf springs. The recent embargo on shipments by one mill has been lifted but there is a tendency for consumers to defer rather than quicken.

Buffalo, Oct. 2.—Higher prices have prevailed in representative sales of heavy melting steel and other materials. No. 1 steel is reported to have sold for as much as $16 while similar advances are noted in prices of other grades under contract to assure brisk yard activity this month and to guarantee against decline.

Detroit, Oct. 2.—Scrap dealers here were exceedingly active last week in bidding upon October scrap production of the numerous automobile companies. The market borrows firmness from other sections, such as Pittsburgh, where dealers have sold large tonnages of heavy melting steel to large mills at higher than $17. This makes the price here $12 to $12.50. Compressed sheets are up 25 cents; forge flashings advance 50.00c, and heavy auto cast goes up $1. Scrap deliveries are heavy into Cleveland, Youngstown, Pittsburgh and Buffalo—the latter by water.

Cincinnati, Oct. 2.—The scrap market is lively in general and is expected to be particularly active after this week, when rail offerings have been distributed.

St. Louis, Oct. 2.—Iron and steel scrap continues on the upturn. Dealers are firm in their views and are holding tightly, while consumers, despite need of material, are resisting strenuously with the result that actual trading is relatively light.

Toronto, Ont., Oct. 2.—While no new developments have appeared in iron and steel scrap, demand continues steady. Toronto, Hamilton and Montreal melters are showing keen interest, taking regular shipments on contract and augmenting them by spot orders.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$22.00
Steel axles	20.00
Car wheels	16.00
Stove plate	13.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	7.50

TORONTO

Steel axles	14.00
Iron axles	16.00
Heavy melting steel	8.50
Turnings	7.00
No. 1 mach. cast (net)	15.00
Malleable, (net)	13.00
Stove plate (net)	9.00

Birmingham, Ala., Oct. 2.—Iron and steel scrap is in demand and dealers manifest interest only for short periods ahead, anticipating better quotations later. Heavy melting steel is quoted at $10 as minimum.

Cleveland, Oct. 2.—Scrap activity shows no expansion as far as consumers are concerned. Quotations are firm, upheld by moderate dealer transactions. Many of the recent shorts, however, have been covered, and the market awaits the first showing of real interest on the part of the mills. Heavy melting No. 1 is unchanged at $13.50 to $14. Cast iron borings, No. 2 busheling, mixed borings and short turnings, all are up 25 cents; forge flashings are up 50 cents as are machine shop turnings.

Papers Announced for Institute Meeting

Three sessions, one in the morning, one in the afternoon and a banquet in the evening, will be held at the thirty-fourth general meeting of the American Iron and Steel institute in Hotel Commodore, New York, Oct. 26. The following papers are to be presented during the meeting:

"An Acoustic Laboratory for the Testing of Music and Other Steel Wires," by W. B. White, acoustic engineer, American Steel & Wire Co., Chicago.

"Uniformity, Continuity and Magnetic Testing," by A. V. de Forest, research engineer, American Chain Co., Bridgeport, Conn.

"Steel Requirements of the Aircraft Industry," by H. J. French, senior metallurgist, bureau of standards, Washington.

"Recent Observations of Some European Iron and Steel Conditions," by C. A. Meissner, United States Steel Corp., New York.

"The Present Status of Structural Steel Welding," by F. T. Llewellyn, president, American Welding society, New York.

"Steel Used by the Automotive Industry," by W. J. MacKenzie, vice president, Interstate Iron & Steel Co., Chicago.

Semifinished

Market Is Firm and Active—Sheet Bars Booked at $33, Pittsburgh; Billets and Slabs $34

CONSUMERS of sheet bars, billets and slabs are protecting their fourth quarter requirements with their usual sources of supply. The firmer tendency noted in the market in recent weeks is confirmed by recent sales. Mills in the Pittsburgh district are obtaining $33 for sheet bars, and $34 for billets and slabs. The automotive industry continues to take large tonnages of forging billets.

SEMIFINISHED STEEL PRICES, PAGE 854

Pittsburgh, Oct. 2.—A stronger market is appearing in semifinished steel in this district. Sellers report little difficulty in obtaining $33 for sheet bars, lower prices having disappeared. Rerolling billets, 4 x 4-inch, and slabs are being sold at $34, with $35 prevailing on small billets and slabs. Forging billets continue steady at $38 and wire rods at $42. Forging billets have been in active demand by the automotive industry, and buying also has been sustained for other semifinished grades. Some mills are practically out of the market on semifinished material due to lack of excess capacity, and have been naming higher than currently quoted figures on some business.

New York, Oct. 2.—While a number of the wire rod consumers in this district are under contract for the fourth quarter, a good many have not taken such action. There is a good spot demand for wire rods and on this business the market appears to be firm at $42, base, Pittsburgh. Billet business is not active, due to small consumption of billets in this territory, but on such sales as are being made the prices are firm at $33, base, Pittsburgh, for open-hearth rerollers, plus $5 a ton for forging quality.

Youngstown, O., Oct. 2.—The bulk of present business in semifinished steel material appears to be confined to sheet bars and wire rods. The billet and slab orders have drifted into negligible tonnages. The general sheet bar price for fourth quarter delivery by important makers is $33, Pittsburgh and Youngstown, and on wire rods is $42, Pittsburgh and Cleveland. For such billets and slabs as are bought here, $34 appears to be the usual quotation.

August Pails, Tubs Up

Washington, Oct. 2.—August shipments of galvanized sheet metal ware totaled 186,864 dozens, making a substantial gain over the July total of 114,343, the department of commerce reports.

The Market Section

Bars

Demand Brings Enlarged Production—Prices Firm and Fourth Quarter Needs Being Covered

CONSUMPTION of soft steel bars is the feature of the steel market. Chicago mills are operating at capacity and at Pittsburgh some makers find output is the best in five years. Fourth quarter contracts are being signed readily at an advance of $2 per ton over third quarter. Rail steel bars are also selling at an advance of $2 per ton.

BAR PRICES, PAGE 853

Chicago, Oct. 2.—Bar mills are operating at capacity in this district, with deliveries in some sizes and sections lengthened to four and five weeks. September sales, specifications and shipments in bars and other heavy finished products made a substantial gain over August, some estimates of this increase being 10 per cent. While figures are incomplete, it is indicated the September volume may show the second best monthly total of this year. Consumption of bars apparently is making steady gains, as users are increasing specifications and are not building up stocks to any extent. More interest is being shown in fourth quarter contracting, and bar producers are closing more contracts at 2.10c, Chicago. Mills see less hesitancy in coverage by consumers for the next 30 to 60 days at the higher prices. All preferred quantity buyers have had their prices advanced $2 a ton. A number of billet reinforcing bar fabricators have not closed for the quarter, but they are expected to do so soon. Cold rolled bar finishers and shafting makers are taking good tonnages. Farm implement and automotive industries are leading in demand for bars. Drop forgers serving the automotive and parts manufacturers are busy.

Rail steel bar makers are taking business at the $2 advance to the manufacturing trade, or 1.95c, Chicago Heights. Rail steel bars for road work are quoted at 1.95c, while bars for bridge and culvert work are 2.05c, Chicago Heights. Bar iron demand is light from railroads, but mills are getting some implement business. Bar iron is 2.00c, Chicago.

Pittsburgh, Oct. 2.—Specifications for hot-rolled bars against expiring third quarter contracts were heavy during the last week of the month. One interest reports the largest volume of business for any week this year, while another reports that September was its largest month in five years. Contracting for fourth quarter is well advanced, with users paying an increase of $2 a ton over third quarter. Only large users were able to obtain 1.90c, most signing at 1.95c and 2.00c.

New York, Oct. 2.—Evidence of strength in steel bars continues to present itself. While certain large buyers were able to place fourth quarter requirements at 1.90c, base Pittsburgh, equivalent to 2.24c, delivered New York, this price seems to have disappeared. As a matter of fact, 1.90c was restricted to comparativeiy few companies. The usual minimum is 1.95c, base Pittsburgh, while on most new sales 2.00c, base Pittsburgh, is being done. While demand has dropped off somewhat, makers have good order books and some mills are operating at practically full capacity in production of bars. The Bethlehem Steel Co. is operating its Lackawanna bar mills on Sundays for the first time in years.

Buffalo, Oct. 2.—Sellers agree 2.10c, Lackawanna, is the current low price on fourth quarter bars. Operations show a slight gain as the result of better business, with 33 of 37 open hearth furnaces producing this week.

Detroit, Oct. 2.—While 2.00c is the officially quoted figure on merchant steel bars and some orders are being specified on that basis, it is the small tonnage user who pays it. Others pay 1.95c and preferential tonnage users enjoy the 1.90c figure. An advance of $2 or $3 over third quarter thus is registered, since some buyers who then paid as low as 1.80c now pay as high as 1.95c. Some sellers took specifications up to the end of the month on old contracts; others nipped them off Sept. 10. Fourth quarter consumption will remain on a par with third.

Cleveland, Oct. 2.—New contracts for hot-rolled merchant steel bars for the fourth quarter are being written at 1.90c to 2.00c, Pittsburgh, with Dec. 10 as the expiration date. Local competition, in some instances, is being met by outside interests on the basis of 1.925c, delivered, Cleveland. Large tonnages, it is reported, have gone recently to local mills at 1.875c, delivered. Demand continues to hold up well. The volume of September business placed in this territory exceeded August totals by close to 50 per cent.

Plates

Market More Active, with Larger Tonnages Appearing—Users Contracting for Fourth Quarter

PLATE specifications were exceptionally heavy in the last week of the third quarter. New business is appearing in better volume. Several eastern railroads are taking bids on fourth quarter requirements. New York state pipe line projects call for over 15,000 tons of plates. About 3100 tons were awarded for Pacific coast tank requirements and inquiries are pending for 8000 tons.

PLATE PRICES, PAGE 853

New York, Oct. 2.—Heavy specifications against expiring third quarter contracts featured the plate market in this district during the past week. Practically all of this business was taken at the third quarter prices. The market generally now is $2 a ton higher, current prices ranging from 2.05c to 2.15c, base, Coatesville, while quite a few consumers are on a basis of 2.10c, base, Coatesville. The eastern mills generally are holding the 2.15c, Coatesville, figure in connection with small lots and are adding thereto the less-than-carload freight rate which makes the prevailing asking price on small lots in New York, 2.37½c, delivered. The usual range on carloads at New York now is 2.22½c, delivered. The Lackawanna, Lehigh, and Central of New Jersey railroads last week took bids on their fourth quarter plate requirements while the New York Central railroad is to open bids today on its fourth quarter requirements. The Standard Oil Co. of New Jersey and the Sinclair interests entered the market for limited tonnages of plates during the past week. It is expected that a pipe line at Albany, N. Y., will come up for bids within the next few weeks. This will require about 10,000 tons of tank plates. About 3815 tons of tank plates and 3000 tons of sheet piling are required for the 20-mile water line between Yonkers and South Brooklyn to be constructed for the New York board of water supply. About 3625 tons of plates are involved in a pipe line on which the city of Detroit opened bids last week.

Pittsburgh, Oct. 2.—Additional barge awards and continued activity in other plate consuming lines appear to indicate a continued fairly active demand for this product. Recent buying has been well maintained and contracting for fourth quarter is fairly well along. New contracts vary from 1.90c to 2.00c, with the majority of large users signed up at the lower figure. A total of 22

barges involving about 3400 tons of plates and shapes were placed recently.

Cleveland, Oct. 2.—Miscellaneous plate demands continue almost unabated, although boiler shop needs seem to be shrinking. Small tankmakers are active in the manufacture of gasoline station and other tanks 30-inch to 10-feet in diameter. Individual orders, however, usually comprise 1 to 5 instead of as formerly 20 to 40. Blue annealed sheet competition is keen since a condition is reached where material 3/16-inch thick costing 2.15c from plate mills (base 1.95c plus 0.20c extra) is avail-2.00c less 0.05c or, if wider than 45 inches, at 2.05c (base 2.10c less 0.056c).

Chicago, Oct. 2.—Despite lack of orders for railroad rolling stock and oil tank plates, operations of plate mills in this district are close to 80 per cent. Mills rolling lighter plates are at capacity, but gaps occur in schedules of the heavier mills. One producer reports plate business good for a week ahead, and that this situation has existed for some weeks, but backlogs are not reassuring. Miscellaneous manufacturing lines are steady users of light plates. The Denver municipal and county work, including the 12,000 tons of plates for a water line, has not been closed. About 1000 tons of oil tankage was closed during the week. Plate users not buying in quantities now are obliged to purchase on the basis of 2.10c, Chicago.

CONTRACTS PLACED

2700 tons, 48 and 60-inch lockbar pipe for Detroit; to T. A. Gillespie.
1860 tons, 12 coal barges for Crucible Fuel Co.; to American Bridge Co.
1550 tons, five 80,000 barrel tanks for Rio Grande & Barnsdall Oil Companies, Santa Barbara, Calif., to McClintic-Marshall Co.
1550 tons, five 80,000 barrel tanks, Shell Oil Co., San Francisco, for Martinez plant; to Western Pipe & Steel Co.
1200 tons, eight coal barges for Crucible Fuel Co.; to Jones & Laughlin Steel Corp.
450 tons, three tank barges, for American Barge Line, to Riter, Conley Co.
335 tons, two barges for Anderson-Tully Co., Memphis, Tenn.; to American Bridge Co.
150 tons, three 80-foot plate girder spans, Champion Fiber Co., Canton, N. C.; to Austin Bros.
150 tons, standpipe, 100,000-gallon capacity, Newton Memorial hospital, Cassadaga, N. Y.; to Pittsburgh-Des Moines Steel Co.
Unstated tonnage, several Scotch boiler heads, American Shipbuilding Co., Cleveland, to Lukens Steel Co.

CONTRACTS PENDING

4000 to 5000 tons, Detroit river tunnel; contracts to be awarded within next few days.
1200 tons, pipe line, Hood River, Oreg. Bids Oct. 10.

Increase Valley Rate

Youngstown, O., Oct. 2.—While independent steelworks operating rates have remained at near capacity, this week United States Steel Corp. subsidiaries have advanced their operations to 80 per cent from their former 75 per cent rate.

Pipe

Municipal Demand Lags—Chicago Opened Bids on 2120 Tons—Oil Country Demand Improves

MUNICIPAL demand for cast pipe is sluggish. Chicago developed only two bids on 2120 tons. New York wants 200 tons of 12-inch and but 500 tons of 6 to 24-inch were ordered for Douglastown, Long Island. Export demand for casing is improving as is demand originating in California. New line pipe business is slow.

PIPE PRICES, PAGE 854

Pittsburgh, Oct. 2.—Steel pipe tonnage for oil country requirements continues in satisfactory volume. The outlook for this field for the remainder of the year is encouraging. Several mills are busy on gas and oil line pipe jobs awarded recently but no new developments are reported on pending or contemplated lines. Drilling continues active in the lower California district, and considerable casing business is being received from this source. Jobbers are turning over their stocks of merchant pipe more rapidly.

New York, Oct. 2.—Buying of cast pipe continues spotty. Little municipal demand is outstanding and inquiry is backward from private sources. Notwithstanding influences of a stronger raw material market, pipe prices appear easier.

Buffalo, Oct. 2.—The Iroquois Gas Co., Buffalo, will probably lay approximately 40 miles of pipe of various sizes this fall in the vicinity of Arcade, Delevan, Franklinville and Yorkshire, N. Y.

Cleveland, Oct. 2.—Jobbers are ordering more standard full weight merchant pipe in buttweld sizes, as plumbers enter their active fall period. As usual lapweld demand is on a low plane here. Building activity holds up well, sustaining ¾-inch pipe consumption.

Chicago, Oct. 2.—Contractors take frequent small lots of cast iron pressure pipe for subdivision work but ask for rush shipments to take advantage of favorable weather. Municipal inquiry is extremely light and probably will not develop real tonnage during the remainder of the season. Bids for the 2120 tons of 6, 8 and 12-inch pipe for Chicago were $34.80 and $35.80, base, Birmingham. Glamorgan Pipe & Foundry Co., was low. While some weakness had been noted in recent lots of 6 to 24-inch pipe, it is indicated by the Chicago bids that the Birmingham base quotation of $34 to $35 is fairly firm here.

Birmingham, Ala., Oct. 2.—Cast iron pressure pipe shops are complying with requests for quick deliveries. Numerous small orders are received. The base price is firm at $34 to $35 per ton for 6-inch and over sizes. United States Cast Iron Pipe & Foundry Co. is adding to its North Birmingham plant to increase its centrifugal pipe tonnage. Lengths produced will include 18 feet.

CONTRACTS PLACED

500 tons, 6 to 24-inch cast pipe and fittings for Douglastown, Long Island, awarded through a general contractor to Donaldson Iron Works.
212 tons, Hanford street sewer, Seattle; to United States Cast Iron Pipe & Foundry Co.
200 tons, centrifugal pipe, improvement Fifty-first avenue northeast, Seattle; to American Cast Iron Pipe Co.

CONTRACTS PENDING

2120 tons, 6, 8 and 12-inch pipe for Chicago, Glamorgan Pipe & Foundry Co. and United States Cast Iron Pipe & Foundry Co. only bidders at $34.80 and $35.80, base, Birmingham, respectively.
350 tons, 6 to 10-inch, cast pipe, State hospital, Waverly, Mass.; bids in.
200 tons, 12-inch cast pipe for the department of water supply, gas and electricity, New York City, for installation in the Queens, Gregory Construction Co., low on general contract.
156 tons, 6 to 30-inch class A pipe, State hospital, Orangeburg, N. Y.; general contract placed.
142 tons, 4 to 14-inch class B, Oxnard, Calif. Bids open.
Four to five miles of six to 8-inch cast pipe for the Riverhead water district, Riverhead, Long Island, general contractors' bids asked.

Plan Cast Pipe Plant for New England

New York, Oct. 2.—The first plant ever erected in New England for the production of standard sizes of cast iron bell and spigot pipe is planned by the Warren Foundry & Pipe Co., 11 Broadway. The plant, according to proposed plans, will be erected at Everett, Mass., beside the furnaces of the Mystic Iron Works. A close affiliation between the two companies, with the likely absorption of the Mystic company by Warren is strongly intimated.

Actual acquisition of a site at Everett is pending municipal action on closing certain streets traversing the property. Until title to the property is definitely settled no official confirmation by the companies is expected.

The Warren Foundry & Pipe Co., a subsidiary of the Replogle Steel Co., with pipe plant at Phillipsburg, N. J., has long been a leading sellers of gas

and water pipe in New England. The prospects of having raw materials close at hand, and a substantial saving in freight rates, have made the plan to establish a pipe plant in that territory unusually attractive.

The freight rate from Phillipsburg, N. J., to leading consuming points in New England is now $5.10. While new rates will probably be established upon completion of the proposed plant, it is believed the company will be able to effect a considerable saving on New England shipments.

What the capacity of the new plant will be is not known, but it appears safe to assume it will have no bearing on the company's intention to continue to operate the plant at Phillipsburg, N. J., which has a capacity of about 300 to 350 tons a day.

The Mystic Iron Works was put in operation in September, 1926, one of several subsidiaries of the Massachusetts Gas Companies. The furnace can produce 500 tons or more a day. In this case the pig iron has been a by-product, resulting from large coke oven capacity in New England.

Tin Plate

Specifications Continue Active—Operations Slower

TIN PLATE PRICES, PAGE 853

Pittsburgh, Oct. 2.—Tin plate operations have declined still further in line with the usual seasonal trend, but still are at a high October rate. Most consumers, with the exception of canmakers, still are specifying actively. Tin plate continues at $5.25 per base box. Operations in the district are between 80 and 85 per cent of capacity.

Bolts, Nuts, Rivets

Specifications Increasing Rate—Most Contracts Made

NUT AND BOLT PRICES, PAGE 854

Pittsburgh, Oct. 2.—Practically all consumers are under contract for fourth quarter requirements of bolts, nuts and rivets at 60 to 70 off on bolts and nuts and 2.90c, Pittsburgh, on large rivets. Specifications are steady. The total September tonnage was equal to or slightly better than the August volume. Current buying is of a diversified nature. Operations are unchanged at 60 to 65 per cent.

Cleveland, Oct. 2.—Regular customers of nut and bolt manufacturers have arranged for fourth quarter protection at 70 off. On smaller quantities as high as 60 off has applied. Automotive and agricultural implement needs are growing. Steam shovel manufacturers and others are increasing their orders. Rivet orders, too, are plentiful from fabricating and other shops. Car and locomotive shop requirements are negligible.

Sheets

Market Firm—New Discount Rate Is Holding—Consumers Buying Further Ahead

SHEET consumers are buying further ahead, and deliveries are being extended. Chicago mills report business at the peak rate of the year to date. Automotive and other large consumers continue to specify heavily. The new prices are firm. Most makers are disregarding offers at the old discount, and report opposition to the new rate is diminishing.

SHEET PRICES, PAGE 853

Youngstown, O., Oct. 2.—Such large volumes of specifications for the various grades of sheets have been placed upon the operating schedules of local mills in the past week or ten days that works operations are at 89 per cent with the independents. This added to orders placed on the books are declared to insure undiminished rates of operations here throughout this month and well into November. Some mills now are warning their sales offices to refer to the home office all inquiries for future tonnages for delivery to the end of 1928. Sales of black and automotive sheets continue heavy, with shipments in September exceeding August, and October expected to surpass September. But the galvanized and blue annealed shipments are not so satisfactory, due to lagging demand and keen competition. The fourth quarter black price is held firmly at 2.75c, Pittsburgh, and at 4.00c for automotive sheets. More talk is heard of the possibility of a price of 4.25c for autobody sheets in the first quarter of next year, this because this grade of sheets did not advance for the fourth quarter by $2 a ton as did other grades.

Pittsburgh, Oct. 2.—Steel sheet consumers show an increasing tendency to order further ahead since mills are encountering difficulty in meeting requested shipments. Buying continues active, with the automotive and other large industries specifying at the active rate which has held for a number of weeks. Requirements for material in connection with reconstruction work in the sections visited by the recent tornado have made it necessary to push back shipments to other consumers. Mills report little difficulty in obtaining 2.75c, Pittsburgh, for sheet mill black, with business in tin mill black going at 2.90c, galvanized at 3.50c, blue annealed at 2.00c, and full finished at 4.00c. All offers of business carrying the old 2 per cent cash discount have been rejected and opposition to the reduction to one-half of 1 per cent is dying out. Operations show no slackening in the district, the American Sheet & Tin Plate Co. continuing around 90 per cent of capacity.

Buffalo, Oct. 2.—Specifications for sheets have improved to such an extent that operations of district producers have been advanced to fully 90 per cent. Fourth quarter prices are firm at 2.75c, base, Pittsburgh, for black and 4.00c for full finished.

Cleveland, Oct. 2.—More tonnage is accruing to the sheet mills than is usual at this time of the year. Automotive demands continue in the dominating position. Deliveries are increasingly deferred. On the common finishes four to five weeks are needed but on the more highly finished material six to ten are required. With the exception of tonnage for the steel barrel manufacturers, black sheet orders carry a 2.75c minimum. Departures from the 3.50c price on galvanized are few. Blue annealed sheets are firm at 2.00c to 2.10c and the full finished 4.00c price is substantiated by numerous sales.

Detroit, Oct. 2.—Because they see no letup in their sheet consuming rates buyers have gone ahead making their fourth quarter arrangements at the new and higher figures and have for the most part accepted the new cash discount terms. While specifications from some automobile manufacturers will be less this month than last, others will equal if they do not exceed September's tonnage. Agricultural implement makers are specifying heavily. The 4.00c price on full finished is fully substantiated. Blue annealed is firm at 2.00c to 2.10c while black and galvanized orders at 2.75c to 3.50c are growing. In galvanized it develops that early in the third quarter some sellers covered their customers fourth needs at the old figures.

Chicago, Oct. 2.—Sheet sales in this territory are in good volume. Incoming orders are at the peak rate for this year. Sales are quickly translated into specifications, and most buyers want early delivery. It is becoming increasingly difficult for mills to take on spot business. Demand is well distributed among all manufacturing and roofing lines. Small container makers and furniture and locker manufacturers are good buyers. Mills are planning to advance quotations $2 a ton. Chicago delivered prices are unchanged at 2.90c for No. 24 black, 3.65c for No. 24 galvanized, and 2.15c for No. 10 blue annealed.

St. Louis, Oct. 2.—Sheet sales in September were slightly above those of August, which was an exceptionally satisfactory month. Orders and specifications for October were fully up to expectations. Prices are steady.

Structural Shapes

Shapes Active in Closing Out Third Quarter —Many Large Jobs Awarded—Total of Pending Work Is Large in Many Sections

PURCHASES of structural material continue on a high plane. Shipments in September were practically on a parity with August. Specifications last week were heavy closing out third quarter business. While higher prices generally are effective in connection with fourth quarter contracts, little or nothing has been specified as yet. Awards again were numerous; 15,000 tons being added for the merchandise market at Chicago; 9500 tons representing two jobs at Pittsburgh; and several other 1000 to 5000-ton jobs being let elsewhere. Pending work in the East and West is estimated to involve 425,000 tons. This either is now out or will come out in the fourth quarter. Awards for the week aggregate 61,170 tons the fifth largest week of the year.

STRUCTURAL SHAPE PRICES, PAGE 853

New York, Oct. 2.—Structural buying and inquiry are heavy, with both shape and fabricated material prices on definitely higher levels. Shapes now are firm at 2.195c to 2.245c, New York. Heavy buying as the month closed is believed to have made September one of the best this year in this district. One large mill interest, commenting on structural shape demand throughout the East, asserts that September business was by far the largest for any month this year. This same interest states that a survey of active projects in both the East and West which now are in the market or will come in during the fourth quarter, shows approximately 425,000 tons of structural work in prospect and that this figure does not include projects of less than 1000 tons. Prompt shipments from shape mills are becoming increasingly diffcult to obtain. Fabricators await with keen interest, the action of Mayor Walker on the building code amendment, changing stress allowance from 16,000 to 18,000 pounds. In some quarters it is believed possible he will urge a revision of entire code, resulting in considerable delay in the application of this particular proposal.

Philadelphia, Oct. 2.—Heavy specifications were received last week for finished steel, from buyers taking advantage of expiring third quarter prices. September was the biggest month of the year from the demand standpoint. Inasmuch as manufacturing operations are heavy this steel is being consumed. The trade expects Ocotber tonnage to surpass September's.

Shape prices are the firmest seen in a long time, 2.05c at nearest eastern mill being the usual minimum while on small lots as high as 2.15c mill is being done. Eastern shape mills operate at 75 to 85 per cent.

Pittsburgh, Oct. 2.—Fabricators are specifying actively for plain structural material and are busy on old work. Fourth quarter contracts have been signed at from 1.90c to 2.00c, depending upon the size of the consumer. A fair volume of inquiry is coming out. New awards have not been numerous although one interest has booked 9500 tons for two jobs. Structural steel for the second section of the Cathedral of Learning, University of Pittsburgh, just awarded, involves 4500 tons.

Cleveland, Oct. 2.—Considerable work is on architects' boards presaging a constant demand for shapes throughout the fourth quarter. Some of this is about ready for release. Some recent bids on material fabricated and erected were from $71 to $74 per ton. Plain material is stronger. Fourth quarter contracts are being written at 1.90c to 2.00c. Mill specifications are heavy. The Eaton Axle & Spring Co. addition was awarded to McClintic-Marshall Co.

Building permits issued at Cleveland in the first nine months reached a value of $40,998,000 or $8,323,475 ahead of the January-September period in 1927. September permits, however, dropped in value to $2,028,725 from $2,659,075, the September total a year ago, a decline of $630,350.

Detroit, Oct. 2.—Structural shape tonnage is well sustained here, although of late, awards have been small as compared with a year ago. While some 1.90c arrangements have been made for fourth quarter with large tonnage users, the average price will be 1.95c or higher, since on some small tonnage orders 2.00c or even higher applies.

Chicago, Oct. 2.—Structural steel to be used in the Chicago Merchandise Mart, awarded several months ago to Bethlehem Steel Co., has been increased by 15,000 tons to 60,000 tons. A considerable part of this tonnage has been given to at least one local fabricator. Fabricating shops have a good program of work before them. Fabricators specify largely for projects immediately in sight, but carry the usual 30 to 60 days' stock sizes of plain material. Mills report structural specifications heavier than a week ago, but deliveries are easier in shapes than in bars and plates. Operations are slightly above 75 per cent. Small quantity buyers of plain material must now negotiate on the basis of 2.10c, Chicago, while quantity users have had their preferred prices advanced $2.

Awards Compared

	Tons
Awards this week	61,170
Awards last week	26,800
Awards two weeks ago	79,928
Awards this week in 1927	30,084
Average weekly awards, Sept.	42,968
Average weekly awards, 1928	40,059
Total awards to date, 1927	1,419,867
Total awards to date, 1928	1,562,326

CONTRACTS PLACED

15,000 tons, Chicago Merchandise Mart, Chicago, added to 45,000 tons awarded Bethlehem Steel Co., several months ago.

5000 tons, building, Pittsburgh Plate Glass Co., Crystal City, Mo.; to McClintic-Marshall Co.

4500 tons, second section, Cathedral of Learning, University of Pittsburgh; to McClintic-Marshall Co.

4480 tons, plant, Viscose Corp., Meadville, Pa.; to McClintic-Marshall Co.

2700 tons, garage building, Michigan Boulevard Garage Corp., Wabash avenue and Van Buren street, Chicago; to American Bridge Co.

2500 tons, Hermann, Mo., bridge, National Toll Bridge Co.; to Foundation Co., New York.

2300 tons, office building for Southern railway, Washington; to Barber & Ross.

2000 tons, Du Pont plant, Waynesboro, Va., to Virginia Bridge & Iron Works.

1900 tons, miscellaneous bridges, Great Northern railroad; to American Bridge Co.

1892 tons, Macey department store addition, New York; to Levering & Garrigues Co.

1600 tons, apartment, Sixty-ninth street and Central Park west, New York, to Hinkle Steel Construction Co.

1400 tons, apartment East Seventy-ninth street, New York, to Easton Structural Steel Co.

1200 tons, apartment, 101st street and Fifth avenue, New York; to Harris Structural Steel Co.

1200 tons, apartment, East Tenth street, New York; to Hedden Iron Construction Co.

1200 tons, office building, Richfield Oil Co., Sixth and Flower streets, Los Angeles; to Llewellyn Iron Works.

1180 tons, building, Rhodes, Haverty Co., Baltimore; to unnamed interest.

1175 tons, Red River bridge, Grand Forks, N. Dak.; to Minneapolis Steel & Machinery Co.

1000 tons, plant in Ohio for Tennessee Copper & Chemical Co., recently noted as awarded an unnamed fabricator; placed with Fort Pitt Bridge Works.

1000 tons, apartment, 101st street and Broadway, New York; to Easton Structural Steel Co.

950 tons, floors and reconstruction, Harahan bridge, Memphis, Tenn., to American Bridge Co.

725 tons, warehouse for navy department, San Diego, Calif.; to Llewellyn Iron Works.

650 tons, industrial building, Cornell university, Cornell, N. Y.; to Kellogg Structural Steel Co., Buffalo.
525 tons, building Fox Realty Co., San Diego, Calif.; to Llewellyn Iron Works.
500 tons, building Reo Motor Car Co., Lansing, Mich.; to Mahon Structural Steel Co.
438 tons, Sand point hangar, Seattle; to Isaacson Iron Works.
430 tons, addition, Eaton Axle & Spring Co., Cleveland; to McClintic-Marshall Co., through Crowell & Little Construction Co.
345 tons, building Commercial Milling Co., Detroit; to Whitehead & Kales.
325 tons, apartment, 4545 West Second street, Los Angeles; to Union Iron Works.
325 tons, apartment, 1811 Whitely avenue, Los Angeles; to Union Iron Works.
309 tons, storage and reclaiming system for New York interest; to unnamed fabricator.
300 tons, marine barracks, Quantico, Va., to Virginia Bridge & Iron Co.
300 tons, plant, at Philadelphia, H. J. Heintz Co.; to Lehigh Structural Steel Co.
270 tons, bridge at Zoarville, O., through E. Elford & Sons Co.; to Massillon Bridge & Structural Co.
250 tons, bus terminal and garage, Ontario Street Land Co., Cleveland; to Truscon Steel Co., through Vokes Construction Co.
250 tons, building for Chrysler Motor Car Co., Detroit; to Russell Wheel & Foundry Co.
238 tons, yard improvement, New York Central railroad, Mott Haven, N. Y.; to Jones & Laughlin Steel Corp.
200 tons, Southern railway bridges; to American Bridge Co.
164 tons, office building, Carbide & Carbon Chemical Corp., New York; to Pittsburgh Bridge & Iron Works.
160 tons, storage bins, Hillman Coal & Coke Co., to Jones & Laughlin Steel Corp.
150 tons, building, Gears & Forgings Inc.; to Industrial Construction Co.
150 tons, apartment, 4649 Beverly boulevard, Los Angeles; to Union Iron Works.
150 tons, state bridge, Vermont; to American Bridge Co.
140 tons, crane runway, Northwestern Portland Cement Co., Grotto, Wash.; to Wallace Bridge & Structural Steel Co.
130 tons, plants, Fibreboard Products Co., Stockton, Calif.; to Moore Drydock Co.
125 tons, addition to Washington Pulp & Paper plant, Port Angles; to Isaacson Iron Works.
124 tons, Cashmere bridge, Washington; to Pittsburgh-Des Moines Steel Co.
120 tons, coal pulverizing and burning building, Pacific Coast Cement Co., Seattle; to Hofius Steel & Equipment Co. and Isaacson Iron Works.
100 tons, West Seattle school; to Isaacson Iron Works.
100 tons, hotel on Hyde street, San Francisco; to McClintic-Marshall Co.
Unstated tonnage, Madison, Ind., bridge, National Toll Bridge Co., over Ohio river, between Madison, Ind., and Milton, Ky., to Vang Construction Co., Pittsburgh.
Unstated tonnage, Independence, Kans., bridge, National Toll Bridge Co., over Missouri river near Kansas City; to Union Bridge & Construction Co., Kansas City.

CONTRACTS PENDING

27,000 tons, bridge over Kill Van Kull, between New Jersey and Staten island, for port authority, New York City, bids closed Nov. 5; this project was noted in last week's issue as involving an estimated 20,000 to 25,000 tons.
6000 to 10,000 tons, silk plant, American Enka Corp., Ashville, N. C.; general contract to H. K. Ferguson Co., Cleveland.
3600 tons, subway section 5-A, route 109, Brooklyn; general contractors' bids to be opened Oct. 9.
2500 tons, mill building for Columbia Steel Corp., Pittsburgh, Calif. Bids in.
2000 tons, Lake avenue bridge, Duluth, Minn.
2000 tons, Bullock's department store, Los Angeles; bids in.
1700 tons, lift bridge, Rock Island railroad, Joliet, Ill.; steel bids asked.
1500 tons, bridge reconstruction work, Duluth.
1200 tons, bridge work, Chicago, Burlington & Quincy railroad.
500 tons, building for Junior league, East Seventy-first street, New York; George A. Fuller, general contractor, Flat Iron building, that city.
500 tons (estimated) addition to increase plant capacity 50 per cent, Mullins Mfg. Co., Salem, O. President E. C. Gibson announces plant must be ready by Jan. 1. Bids soon.
450 tons, baseball stand, Rochester, N. Y.
350 tons, bridge for Virginia railroad.
300 tons, Bronx Savings bank, Park and Tremont avenues, New York.
243 tons, Gardiner bridge over Yellowstone river in Montana. Bids opened.
230 tons, Kalama River bridge, Olympia, Wash. General contract to Gilpin Construction Co.
200 tons, bridges for state of New York.
160 tons, apartment, Beverly Hills, Calif. Bids being received.
Unstated tonnage, post office, Elizabeth, N. J.
Unstated tonnage, printing building, Interboro News Co., 525 West Fifty-second street, New York.
Unstated tonnage, publishing buildings, W. Wilson & Co., 952 University avenue, Lockwood, N. Y.
Unstated tonnage, several manufacturing buildings, Carl S. Schultz, Brooklyn; Francisco & Jacobus, 511 Fifth avenue, Manhattan, architects.

Concrete Bars

New York Job Takes 1400 Tons—Increased Prices More Effective

OUTSTANDING among scattered concrete bar awards are a 1400-ton automobile service building at New York and two 300-ton buildings there. Smaller jobs are numerous in various sections. Higher prices, effective Oct. 1 now generally apply, although some protections still are out. Some contractors utilize portable shears to cut mill lengths to requirements at the job.

REINFORCING BAR PRICES, PAGE 853

New York, Oct. 2.—Several good size lettings featured the concrete reinforcing bar market here last week, one involving 1400 tons for the local Packard service building. Yesterday the $2 advance became effective. As far as mill length shipments are concerned, 40, 50 and 60 feet, the new price now is 2.00c, base, Pittsburgh, equivalent to 2.34c, delivered, New York. Mill shipments cut to length are quoted 2.25c, base, Pittsburgh. Much tonnage under negotiation here is outstanding at the old prices so the advance remains to be actually established. On local warehouse stocks there has been no change in prices, the quotation continuing 2.80c, base, delivered locally. A feature of interest is that quite a few contractors show a disposition to save the differential between mill lengths and cut to length bars. They will take mill lengths and with portable shears cut them to required lengths on the job.

Boston, Oct. 2.—The only concrete bar award here this week involved 100 tons. Something like 200 tons in odd lots represented numerous small jobs. Price advances of $2 per ton, effective Oct. 1, did not serve to stimulate buying.

Pittsburgh, Oct. 2.—Concrete bars have been more quiet recently. Awards and inquiries are restricted to small tonnages. Although considerable tonnage was placed a short time ago at lower prices, sellers now are firm in quoting 2.25c on cut lengths and 2.00c on mill lengths of billet steel bars.

Buffalo, Oct. 2.—Price advances are now effective by reinforcing bar sellers here. Current quotations are minimum at 2.51c, Buffalo delivery, for lots filled from stock, including larger tonnages of this character. Small-lot business is fair.

Cleveland, Oct. 2.—Quotations gradually are firming up in reinforcing concrete bars. Some of the exceedingly low cut-to-length prices have disappeared, although competition still is keen. Awards are few and far between, except those taking a carload or less. Larger jobs are in immediate prospect. Large tonnages of ¼-inch rounds recently were ordered by a maker of concrete beams for retaining walls.

Detroit, Oct. 2.—Two important concrete bar lettings are up for early award. The group of buildings for the United States customs and immigration departments will require 300 to 500 tons and a similar tonnage will be needed for the Marine hospital, on which the general contract has been let to the Ring Construction Co., Minneapolis.

Chicago, Oct. 2.—An abundance of small-lot reinforcing bar building work features the market in this district. A number of larger building projects are being held up by credit and financing conditions. Engineers' and architects' boards are crowded with proposed work, but bar purchases will probably be deferred until later. Rail steel reinforcing bar fabricators are seeking to establish a minimum of 2.10c for lots of 18 tons and over. Billet bar prices are 2.30c to 3.00c, depending upon quantities ordered.

Awards Compared

	Tons
Awards this week	6,515
Awards last week	6,190
Awards two weeks ago	3,363
Awards this week in 1927	5,880
Average weekly awards, Sept...	5,145
Average weekly awards, 1928..	6,856
Total awards to date, 1927	221,055
Total awards to date, 1928	267,398

CONTRACTS PLACED

1400 tons for service station for Packard Motor Car Co., New York, to Jones & Laughlin Steel

Corp., through Turner Construction Co.
600 tons, grade crossing eliminations, Nickel Plate railroad, Cleveland; to Patterson-Leitch Co.
600 tons, apartment, 4940 East End avenue, Chicago; to Calumet Steel Co.
600 tons, new unit, sewage disposal plant, Stickney, Ill.; to Barton Spider Web System Inc.
575 tons, military buildings at Fort Lewis, Wash; to Pacific Coast Steel Co.
500 tons, power house at India Basin, San Francisco for Great Western Power Co.; to Pacific Coast Steel Co.
500 tons, food warehouse, Northern Ohio Produce Co., Cleveland, to the Bourne-Fuller Co., through S. W. Emerson Co., general contractor.
300 tons for addition to Abraham & Strauss store, Brooklyn, to Concrete Steel Co., through Spencer, White & Prentiss.
300 tons, apartment, Winthrop and Bryn Mawr avenues, Chicago; to Calumet Steel Co.
300 tons for Rokeach building, New York City, to Jones & Laughlin Steel Corp., through Turner Construction Co.
140 tons, garage, Chicago; to Concrete Steel Co.
100 tons, State hospital, Waltham, Mass.; to Barker Steel Co.
100 tons tor sewage disposal plant, Red Bank, N. J., to Igoe Bros.
100 tons for Bearsley school building, New York City, to Jones & Laughlin Steel Corp., through Turner Construction Co.
100 tons, furniture company building, Chicago, to Concrete Engineering Co.
100 tons, Illinois bridge work, to unstated fabricator.
100 tons, small jobs, Seattle; to Northwest Steel Rolling Mills.
100 tons, apartment, Chicago; to Barton Spider Web System Inc.

CONTRACTS PENDING

575 tons, three buildings for United States army, Fort Lewis, Wash. General contract to Chrisman & Snyder.
350 tons, building Peterson estate, Chicago.
350 tons, grocery warehouse for John Sexton & Co., Chicago. Alfred S. Alschuler, architect.
300 to 500 tons, group of buildings at Detroit for the United States customs and immigration departments.
300 to 500 tons, Marine hospital, Detroit; general contract to Ring Construction Co., Minneapolis.
250 tons for Convention hall, Asbury Park, N. J.
200 tons, apartment, 515 Briar place, Chicago.
170 tons, apartment, Ninth and Union streets, Los Angeles. Bids being received.
155 tons, apartment building, north side, Chicago.
150 tons, Clinic hospital addition East Ninety-ninth street, and commercial building Carnegie avenue between East Ninetieth and Ninety-third streets, Association Building Co., Cleveland; Ellerbee & Co., St. Paul, architects. Bids to be taken in two or three weeks.
150 tons, gymnasium and field house, Wittenberg college, Springfield, O. Bids closed Oct. 1.

Alloy Users Protected

Detroit, Oct. 2.—Alloy bar users, with the exception of the Chrysler Motor Corp., have contracted for their fourth quarter needs. The trade is 75 or 90 per cent protected. Quoted levels are firm at recent advances. Specifications are heavy from Chevrolet, Ford and numerous other automobile companies. Forge shops too are active.

To Northwest by River

Jones & Laughlin Steel Corp., Pittsburgh, has started its first all-river shipment of steel wire products to Minneapolis. The cargo will move via the Ohio river to Cairo, Ill., and then up the Mississippi river to its destination.

Rails, Cars

Export Demand Increases—More Domestic Rail and Accessory Inquiry Appears—Cars Lag

CANADIAN demand for cars, locomotives and rails is an outstanding feature. One interest inquired for 15,000 tons of rails, 1573 assorted cars and bought 35 locomotives. A Porto Rican railroad awarded 100 cars. Domestic car buying lags. Chicago, Burlington & Quincy's rail inquiry is expected soon. Accessory inquiries accompany many recent rail requirements.

RAILROAD TRACK PRICES, PAGE 854

Chicago, Oct. 2.—Chicago district rail mills expect important rail orders this month. Within the next few weeks mills will begin to schedule recent orders, but rail mill operations for the district continue to average 50 per cent. Canadian National railways is in the market for 15,000 tons of standard rails. Detroit, Toledo & Ironton's inquiry for 13,000 tons is still open. Chicago, Burlington & Quincy is expected to order 30,000 tons this month. Distribution of rails announced as a result of the purchases of a week ago are: Chesapeake & Ohio, 45,500 tons, to Illinois Steel Co.. Bethlehem Steel Co. and Inland Steel Co.; Union Pacific, 40,000 tons, to Colorado Fuel & Iron Co., Illinois Steel Co. and Inland Steel Co.; Great Northern railroad, 15,000 tons, to Inland Steel Co., Illinois Steel Co. and Bethlehem Steel Co. Purchases of light rails are in miscellaneous lots.

The Chesapeake & Ohio track fastenings inquiry accompanying its rail order is for 12,000 to 15,000 tons. Great Northern is purchasing 5000 to 7000 tons of track accessories, placing them in various lots. Mills booked 4000 to 5000 tons of track fastenings during the week, including a portion of the Great Northern business.

Specifications for plates and plain structural material from the car building shops in this territory have dropped to small proportions and consist largely of repair work at hand. Estimates are that car building shops in the district are operating only 25 to 30 per cent on the whole.

New York, Oct. 2.—Railroad demand is featured by an inquiry for 1500 box cars, 43 miscellaneous coaches and 30 tank cars and by the placing of 35 locomotives, the equipment all being for the Canadian National railways. The Lackawanna is inquiring for 20 locomotives.

Philadelphia, Oct. 2.—The Pennsylvania railroad specified heavily on all finished steel materials last week and also placed heavy orders for track supplies.

The Pennsylvania railroad is expected to inquire this week for 200,000 tons of rails.

Pittsburgh, Oct. 2.—Demand for track accessories shows little change from the rate of 30 days ago. Total September business compared favorably, however, with that of August. Light rail bookings last month showed a slight gain over those of the month preceding. Several railroads are slow to place their annual rail and fastening requirements. Car buying also lags.

CAR ORDERS PLACED

American Railroad of Porto Rico, 100 cane cars, to Gregg Co. Ltd.
C. C. B. Smokeless Coal Co., 5925 coal car trucks to Watt Mining Car Wheel Co.
Cerro De Pasco Copper Corp., 20 freight cars, to American Car & Foundry Co.
New York, New Haven & Hartford, 10 transformer cars, to Osgood Bradley Car Co.
South Africa railways, 400 drop side wagons to Leeds Forge Co., England. These are in addition to 100 cars placed a month ago.

LOCOMOTIVES PLACED

Canadian National, 10 switch engines, to Montreal Locomotive Works Ltd., 15 Santa Fe type locomotives and 10 switch engines to the Canadian Locomotive Co.; these are in addition to 20 4-8-4 type locomotives recently noted as going to the Montreal Locomotive Works Ltd.
Central Vermont, two locomotives, to American Locomotive Co.
National Railways of Mexico, six locomotives to American Locomotive Works.
National Railways of Mexico, six Mallet type locomotives, to an American builder.
Unnamed railroad placed 15 locomotives of the Santa Fe 2-10-2 type and 10 8-wheel switching locomotives with the Canadian Locomotive Co., Kingston, Ont.
Unnamed railroad placed 10 8-wheel switching locomotives and 20 locomotives of the northern type 6.100 class with the Montreal Locomotives Works.

CAR ORDERS PENDING

Canadian National, 1500 box cars and 30 tank cars; also 43 miscellaneous coaches.
Denver & Rio Grande Western, four dining cars.
Freeport Sulphur Co., 15 hopper bodies.
Great Northern, 500 additional steel underframes
Great Northern, 1000 ore and 500 hoppers; formal inquiry expected shortly.
Union Tank line, 200 to 400 tank cars.

LOCOMOTIVES PENDING

Canadian National, 5 locomotives of modified design from the mountain type used on main line passenger or freight service.
Delaware, Lackawanna & Western, 20 locomotives.
Illinois Terminal Co., one locomotive.

A pound of coal in 1927 hauled 7.6 tons of freight and equipment one mile, according to the American Railway association. This was a record.

Strip

Variations Appear in Method of Basing Prices—Fourth Quarter Needs Mostly Covered

SOME stripmakers are departing from the usual method of quoting and are taking all sizes under 6 inches at the same price, while others adhere to the former plan of dividing at 3 inches. Some tonnage has been closed at third quarter prices, which are decidedly lower than current quotations. Automobile demand keeps the market steady.

STRIP PRICES, PAGE 854

New York, Oct. 2.—Hot rolled strip steel is being priced on both triple and double basing systems. The usual range on 6 to 12-inch widths continues 1.80c to 1.90c base Pittsburgh. In some cases mills are taking business at one price for all widths under 6 inches, the usual prices ranging from 2.00c to 2.10c base Pittsburgh. In others the old method of drawing the line at 3 inches is observed, the prices in such bases usually being 2.00c to 2.10c base Pittsburgh for 3 to 6-inch and 2.10c to 2.20c for less than 3 inches. A number of consumers closed for fourth quarter recently at the same prices as for third quarter, in some instances much lower than the above figures. The current range on cold rolled strip steel is 2.75c to 2.85c base Pittsburgh and sales at 2.85c have been made. A few buyers were entered for fourth quarter at around 2.65c a couple of weeks ago but prices under 2.75c now seem to have disappeared.

Pittsburgh, Oct. 2.—Continued activity in automobile production and other consuming lines of hot rolled strip steel is providing mills steady business. Additional fourth quarter contracts have been signed at 2.20c for sizes under 3-inch, 2.10c for 3 to 6-inch, and 1.90c for 6 to 12-inch, although a number of large consumers are protected through fourth quarter at old prices. Cold rolled strip continues active, with sellers reporting considerable business placed at 2.85c, Pittsburgh. Some large users have been able to obtain 2.75c.

Cleveland, Oct. 2.—While some vacuum cleaner and other appliance manufacturers have bought heavily in strip steel, practically 90 per cent of recent hot and cold strip orders were automotive in character. Several cold strip mills are able still to make favorable deliveries but a few of the hot mills are offering dates four weeks hence. Customers have contracted for fourth quarter in cold at 2.75c to 2.85c. In a few exceptional cases of large hot tonnage, buyers of 6 to 12-inch were able to cover at below 1.85c but that was the usual minimum and in some cases 1.90c applied. On 3 to 6-inch stock, 1.90c to 2.00c were the usual figures and while in the narrow widths some could buy at 2.00c, others paid 2.10c to 2.20c. Several of the narrow mills have all the tonnage they can handle for several weeks.

Detroit, Oct. 2.—Although some of the larger cold rolled strip buyers were protected at 2.75c, the current run of orders carries a 2.85c figure for fourth quarter. Tonnage is heavy and while some declines are noted in a few directions, these are compensated for by gains in others. The same applies to hot strips. Regular customers were covered at their third quarter figures, some as low as 1.85c and 1.90c on the wide when their total tonnage would warrant it. Some buyers of wide strips now are asked to pay 2.00c. Narrow strips sell at 2.10c to 2.20c. Intermediate widths usually bring 2.00c. Each order is judged on its own merits and competitive levels on plates as well as blue annealed sheet steel is taken into consideration.

Cold Finished Steel

New Prices Being Maintained Without Serious Opposition

COLD FINISHED PRICES, PAGE 853

Pittsburgh, Oct. 2.—Sellers report a minimum of opposition in obtaining full 2.20c, Pittsburgh, on fourth quarter contracts for cold finished steel, a number of large users, including automotive companies, having signed for requirements for the remainder of the year.

Cleveland, Oct. 2.—Automotive and other consuming industries now are well under cover for fourth quarter requirements of cold finished bars.

Detroit, Oct. 2.—The majority of the cold finished bar users now are under contract for fourth quarter. The 2.20c price has applied.

Wire

Specifications on Larger Scale—Jobbers Slow in Contracting—Nails in Small Demand

SEPTEMBER specifications for wire and wire products were in excess of those of August. Consumers are buying better than jobbers for fourth quarter. Nail demand is at a low level but mills are holding firmly to prevailing prices. Agricultural users in the Northwest are buying heavily and usually ask immediate delivery, indicating small stocks.

WIRE PRICES, PAGE 854

Chicago, Oct. 2.—Specifications for most wire products have reached a high mark. Mills have booked more tonnage for spot shipments than for a number of weeks. Forward contracting is fair in manufacturers' wire, but jobbers are slow in signing contracts for fourth quarter. Stocks of plain wire and nails are being slowly reduced, and sales, while mostly for nearby delivery, are growing. Fourth quarter bookings are at $2.60, Chicago or western mills, for wire nails, and 2.45c for bright plain wire.

New York, Oct. 2.—Demand for wire nails is considerably less than normal. Nail production in no case appears to be higher than 40 per cent of capacity and with some mills not much above 15 or 20 per cent. Despite small business, mills generally are sticking firmly to $2.55, base Pittsburgh, on nails, plus $2 on sales to dealers. The large mills particularly are firm.

Pittsburgh, Oct. 2.—September wire specifications generally showed an increase over August. The feature of buying by agricultural users is the number of rush orders received and the substantial improvement in demand from the northwest, compared with last year. Contracting for fourth quarter is nearly completed at 2.40c for plain wire and $2.55 for wire nails, although some resistance is encountered from automotive companies.

Cleveland, Oct. 2.—Wire nails are slightly more active, jobbers ordering more freely to balance stocks. Some makers expect a decided advance in price by the time first quarter contracts are written claiming $3 would be a more proper figure. Wire specifications, particularly from nut and bolt manufacturers, have been numerous, several orders of late representing highly attractive tonnages. Automotive demand holds well. The 2.40c price on plain wire is firm. Lower than $2.55 on nails is no longer available.

Detroit, Oct. 2.—Wire and wire products such as nails, are moving well into this territory, the ever increasing automotive production sustaining the demand. Only one or two large wire users were able to buy as low as 2.30c, 2.40c is the recognized quotation applying to the usual run of business.

Nonferrous Metals

Less Active Demand for Metals Encountered but Good Volume of Business Continues—Prices Are Firm on Copper, Lead and Zinc

Prices of the Week, Cents a Pound

	Copper			Straits Tin		Lead	Lead	Zinc	98-99%	Spot	Ingot
	Electro delivered	Lake delivered	Casting refinery	New York Spot	New York Futures	New York	East St. Louis	St. Louis	Aluminum	Antimony	Nickel
Sept. 26	15.25	15.32½	15.00	49.00	48.50	6.50	6.32½	6.25	23.90	11.07½	35.00
Sept. 27	15.25	15.32½	15.00	49.75	49.37½	6.50	6.32½	6.25	23.90	11.12½	35.00
Sept. 28	15.25	15.32½	15.00	49.25	49.00	6.50	6.32½	6.25	23.90	11.25	35.00
Oct. 1	15.25	15.32½	15.00	50.20	49.75	6.50	6.32½	6.25	23.90	11.37½	35.00
Oct. 2	15.25	15.32½	15.00	49.87½	49.00	6.50	6.32½	6.25	23.90	11.37½	35.00

NEW YORK, Oct. 2.—While demand was less active this past week the nonferrous metal market continued strong with prices firmly established at the higher levels attained in the recent heavy buying movement. The letdown in activity was noticeable chiefly in copper, possibly because the contrast with the recent past was more marked in this metal. As a matter of fact, however, a good volume of trading was done in all metals throughout the week so that the price position was in no way weakened.

Copper—Consumers continued to display considerable interest but with their early requirements covered the buying movement lost the appearance of eagerness for metal which was so evident a week ago. Nevertheless sales were above average with buyers following a rational buying course. This was true in both the domestic and export markets. In some quarters it is thought considerable buying remains to be done and this fact, coupled with current heavy sales, hints of still higher prices before the end of the year, especially in view of the balance being maintained between production and consumption. At the moment, however, the market appears to be pegged at 15.25c, Connecticut.

Tin—As usual the market has fluctuated this week but the general tendency has been upward. Since last summer a recovery of about four cents has been effected. The market has advanced rapidly during the past few days, the increase in price being due to possible control of the market seen in the formation of a Malayan trust. In fact, the advance in price has been somewhat bewildering to the trade for despite heavy consumption of metal, stocks both in this country and throughout the world increased last month. As this is being written, an easier tone has developed and the market today reacted somewhat, spot Straits metal falling off from over 50.00c to about 49.87½c. Some fair sized buying has been done of late but it has scarcely been sufficient to bring about the rapid recovery of the past week especially in view of the weak statistical showing for September. Some market students see speculative activities behind the movement.

Zinc—While this metal has not moved as rapidly as copper, tin and lead during the week, demand has been fair. Some inquiry has come out and producers have been cheered by expectations of a larger volume of buying being done in the near future. At the same time zinc ore production has been curtailed and smelters also have cut down their output. In the face of this the market has been firm at 6.25c, East St. Louis, the lack of active demand not exerting sufficient influence to force shading anywhere.

Lead—Some metal offered in the outside market at 6.30c, East St. Louis, was promptly snatched up and since then the market has been firmly established at 6.32½c, East St. Louis, and 6.50c, New York. A good volume of business was done this week but demand was not as large as in the preceding week. The statistical position of the market continues to improve.

Antimony—Prices turned upward this week, several sales of importance supporting the bull movement of a week ago. Spot metal now is firm at 11.37½c, duty paid.—*Daily Metal Trade.*

Mill Products

Base prices cents per pound f.o.b. mill

SHEETS	
Yellow brass (high)	19.75
Copper, hot rolled	24.00
Lead, full sheets (cut ¼c more)	10.00
Zinc sheet (100-pound base)	9.75
Zinc strip (100 pound base)	9.00
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	31.30
SEAMLESS TUBES	
Yellow brass (high)	24.62½
Copper	25.50
RODS	
Yellow brass (high, full turnings)	17.50
Naval brass	20.25
WIRE	
Copper, car lots	16.87½
Yellow brass (high)	20.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.75 to 10.00
Chicago	9.75 to 10.00
Cleveland	9.50 to 10.00
HEAVY YELLOW BRASS	
Chicago	7.00 to 7.25
Cleveland	7.75 to 8.00
ZINC	
New York	3.50
Cleveland	3.25
HEAVY COPPER AND WIRE	
New York	12.50
Boston	11.50 to 12.00
Chicago	11.50 to 12.00
Cleveland	12.50 to 12.75
RED BRASS BORINGS	
New York	8.75 to 9.00
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.50
LIGHT COPPER	
New York	11.00
Chicago	10.25 to 10.50
Cleveland	11.25
LIGHT BRASS	
Boston	5.75 to 6.00
Chicago	6.25 to 6.75
Cleveland	6.00 to 6.25
ALUMINUM	
Clippings, Cleveland	17.50 to 18.00
Borings, Cleveland	8.50 to 9.00
Cast, Cleveland	12.50
Cast, Boston	10.50 to 11.00

Secondary Metals

Remelt Aluminum No. 12	15.50 to 16.00
Brass ingot, 85-5-5	13.00

Coke By-Products

Distillates Scarce and Prices Are Steady and Strong

New York, Oct. 2.—Demand for toluol and benzol continues heavy, with sellers having difficulty meeting requirements. Shipments in three to four weeks are the rule on benzol and at least a month on toluol. Toluol sellers cannot recall a period when business has been at such a consistently high rate.

Prices are strong and unchanged and pure and 90 per cent benzol prices also are steady. Commercial xylol, affected by the tightness of toluol supplies, is moving at an increasing rate.

Activity in sulphate of ammonia is confined almost entirely to shipments against contracts placed last summer. The market meanwhile may be quoted at $2.20, delivered, on material for domestic account and $2.35, port, for sulphate in double bags for export. Seasonal dullness continues to dominate naphthalene.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.22	.....
90 per cent benzol	0.22	.....
Toluol	0.35	.....
Solvent naphtha	0.30	.....
Commercial xylol	0.30	.....
Per Pound at Producers' Plants in 250-Pound Drums		
Phenol	0.17	.....
Per Pound at Producers' Plants		
Naphthalene flakes	0.06 to 0.07	
Naphthalene balls	0.06 to 0.07	
Per 100 Pounds Delivered		
Sulphate of ammonia	$2.20	

Warehouse

Several Sections Report September Tonnage Slightly Below August—Sheets Raised at Cleveland—New Cash Discount Adopted

EXCEPT for slight discrepancies, September warehouse orders and shipments were on a par with August, aggregate tonnage dropping off in some cases 5 to 7½ per cent. Buffalo jobbers reduce blue annealed sheets while at Cleveland, they raise black and galvanized. Deferred mill shipments are sending numerous buyers to the warehouses temporarily to satisfy their needs. Demands are as diversified as ever in each section. The new cash discount terms are becoming more universal.

New York—Leading jobbers here have issued notices that effective Oct. 1 they will charge a discount rate of ½ per cent for cash within 10 days on all sheet and strip sales. This has not been adopted by all sheet jobbers. Except in sheets, warehouse prices are firm. Even in sheets some strength is being felt as a result of stronger mill prices. Trading is brisk.

Philadelphia, Oct. 2.—Jobbers report that business is improving. Several began yesterday to sell at ½ of 1 per cent for cash in ten days, instead of 2 per cent. They will, however, absorb the mill reduction in discount on sheets. The general feeling is that their experience of 15 or 16 years ago when the mills reduced the discount on bars from 2 to ½ of 1 per cent is a safe one to follow now. Then, after handing the reduction on to their customers, their collections slowed up so much that they soon reinstated the two per cent discount, thus making it worth while for buyers to borrow money at the bank to discount their bills.

Buffalo, Oct. 2.—Warehouses have just closed their best quarter of the year. Prospects are bright for good business this month. Minor revisions of sheet prices have narrowed the margins between larger lots and small tonnage on galvanized and a reduction on blue annealed.

Pittsburgh, Oct. 2.—Although warehouse business still is on a small-lot basis for immediate shipment, the aggregate is fairly high. September volume shows a gain over August. Sheets and building material continues active.

Cleveland—Effective Oct. 1 sheet jobbers advanced black and galvanized $2 per ton. The new cash discount now applies. Aggregate tonnage for September in most cases was a trifle below that of August, one large interest reporting a 10 or 15-ton deficiency. Diversified demand holds up in all lines.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles	3.30c
New York †††‡	3.25c
Philadelphia*	2.70c
Pittsburgh	2.90c
Portland	2.50c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.04c

IRON BARS

Baltimore	3.10c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.50c
New York††	2.80c to 3.24c
Philadelphia*	2.70c
St. Louis	3.15c
Tulsa	3.75c to 4.04c

REINFORCING BARS

Baltimore	3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.15c
Cleveland	2.25c to 3.00c
Detroit	2.30c to 3.00c
Ft. Worth	3.50c
Houston	3.00c
Los Angeles cl.	2.65c
Los Angeles lcl.	3.00c
New York	2.80c to 3.24c
Philadelphia	2.85c
Pittsburgh	2.75c to 3.175c
San Francisco cl.	2.00c
San Francisco lcl.	2.25c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c to 2.60c

STRUCTURAL SHAPES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.00c
Houston	3.25c
Los Angeles	3.30c
New York†††‡	3.25c to 3.30c
Philadelphia*	2.60c
Pittsburgh	3.00c
Portland	2.90c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

PLATES

Baltimore	3.10c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.00c
Houston	3.00c
Los Angeles	3.30c
New York‡‡	3.30c
Philadelphia*	2.60c
Phila., 3/16-in.*	2.80c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.14c

NO. 10 BLUE ANNEALED

Baltimore	3.45c
Boston, 3/16-in.	3.915c
Buffalo	3.50c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.25c
Detroit	3.35c
Ft. Worth	4.50c
Houston	3.90c
Los Angeles	4.00c
New York‡‡	3.90c
Portland	3.75c
Philadelphia	3.15c
Pittsburgh**	3.00c to 3.10c
San Francisco	3.90c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.75c
Tulsa	4.20c to 4.54c

NO 24 BLACK SHEETS

Baltimore	3.10c to 4.00c
Boston	5.00c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.50c
Detroit	3.95c
Ft. Worth	4.70c
Los Angeles	4.90c
New York†††	3.70c to 3.80c
Philadelphia*†	3.85c
Pittsburgh‡	3.50c to 3.55c
Portland	4.90c
San Francisco	4.95c
Seattle	5.00c
St. Louis	4.10c
St. Paul	3.95c
Tulsa	4.34c

NO. 24 GALVANIZED SHEETS

Baltimore	4.10c to 4.75c
Boston	5.85c
Buffalo	4.70c to 4.85c
Chicago	4.65c
Cincinnati	4.75c
Cleveland	4.35c
Detroit	4.75c
Ft. Worth	5.50c
Houston	5.30c
Los Angeles	5.30c
New York†††	4.25c to 4.50c
Philadelphia*†	4.60c
Pittsburgh‡	4.40c
Portland	5.50c
San Francisco	5.40c
Seattle	5.50c
St. Louis	4.95c
St. Paul	4.90c
Tulsa	6.50c

BANDS

Baltimore	3.85c
Boston	4.015c to 5.00c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.25c
Houston	3.65c
Los Angeles	4.15c
New York‡‡	4.00c
Philadelphia*	3.25c
Pittsburgh	3.60c
Portland	3.75c
San Francisco	4.10c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.50c to 4.66c

HOOPS

Baltimore	4.00c
Boston	5.50c to 6.00c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.25c
Cleveland	3.65c
Detroit	4.15c
New York‡‡	4.50c
Philadelphia*	3.50c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons,	Flats, squares
Baltimore	3.35c	3.85c
Boston	3.55c	4.05c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles (a)	4.50c	.....
New York	3.50c	4.00c
Philadelphia*	3.45c	3.95c
Pittsburgh	3.60c	4.10c
Portland (a)	4.75c	.....
San Fran. (a)	4.25c	.....
Seattle (a)	5.00c	.....
St. Paul (a)	3.85c	.....
Tulsa	4.76c	5.26c

(a) Rounds only.

COLD ROLLED STRIP

Boston, 0.100-inch, 500 pound lots	5.30c
Buffalo	5.85c
Chicago (b)	6.10c
Cincinnati	7.15c
Cleveland (b)	5.95c
Detroit	5.80c
New York	5.15c
Philadelphia (c)	5.00c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c

Flats and Squares

Baltimore, New York, Phila.	6.00c

*Plus quantity differentials. ‡‡Minus quantity differentials. ††Domestic bars. ‡10 to 24 bundles. **25 or more sheets. *†50 or more bundles. †††Newark-Jersey City 4.00c on black and 4.70c on galvanized the more prevalent figures.

Pacific Coast

Plate Awards Heavy and Much in Prospect—Shape Demand Holds Up Well

BUYING of steel on the Pacific coast continues steady, with new projects appearing as others are closed. Plates for oil storage tanks have been placed to the total of 3100 tons, with inquiries pending for several times that tonnage. Cast pipe demand is less. Oil country goods are in strong demand but no pipe line inquiries are current.

San Francisco, Sept. 29.—(*By Air Mail*)—Trading in iron and steel products on the Pacific Coast continues unabated, though prices, generally, are not firm. Plate awards this week were the second heaviest of the year, and more structural tonnage was placed than since the latter part of June. Featuring the market this week was the award of ten 80,000-barrel tanks calling for more than 3100 tons of plates for an office building in Los Angeles, requiring 1200 tons of shapes.

Importations of foreign iron and steel products on the Coast during June fell off considerably from the previous month, a drop of about 50 per cent. The figures for the major items are as follows:

	June 1928 tons	May 1928 tons	June 1927 tons
Pig iron	1,441	2,083	716
Coke	4,901	7,892	9,399
Bars	2,487	6,694	1,893
Shapes	1,455	5,184	2,879
Cast iron pipe	1,231	2,012	3,090
Tubular products	2,169	3,600	7,308

Pig Iron and Coke

Sales and inquiries for foundry pig iron and foundry coke continue limited to small lots for prompt shipment. No change in quotations is noted.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	24.00 to 25.00

*C.i.f. duty paid.

Bars, Plates and Shapes

Most concrete bar lettings this week were lots of 20 to 60 tons. The largest award called for 500 tons for a power house for the Great Western Power Co. in San Francisco, placed with the Pacific Coast Steel Co. The general contract for three buildings at Fort Lewis, Wash., for the United States army, involving 575 tons, has been placed. No action has yet been taken on the 1800 tons for the life science building at Berkeley for the University of California. Little improvement is noted in the price situation on out-of-stock material in the Los Angeles and San Francisco districts, 1.80c base being general.

Awards of plate material this week were heavier, with one exception, than for any other week so far this year and totaled 3117 tons. The Shell Oil Co. placed five 80,000-barrel tanks, involving 1550 tons, for their Martinez plant with the Western Pipe & Steel Co. and McClintic-Marshall Co. secured 1550 tons for five 80,000-barrel tanks for the Rio Grande and Barnsdall Oil companies at Santa Barbara, Calif. No action has been taken on the inquiry of the General Petroleum Corp., Los Angeles, for fourteen 82,000-barrel tanks and on the inquiry for ten 80,000-barrel tanks for the Dominguez plant of the Shell Oil Co., involving a total of 8100 tons. Prices continue to range from 2.20c to 2.25c c.i.f.

Structural shape awards totaled 4451 tons and were the heaviest in over three months. The Llewellyn Iron Works took 1200 tons for the Richfield Oil building, Los Angeles, 725 tons for a warehouse for the government at San Diego and 525 tons for an office building in San Francisco. The Union Iron Works secured 800 tons for three apartments in Los Angeles. Bids were opened on 2500 tons for a tin plate mill for the Columbia Steel Corp. at Pittsburg, Calif., and on 2000 tons for Bullock's department store, Los Angeles. Pending business now exceeds 12,000 tons. Plain material continues firm at 2.35c c.i.f. Coast ports.

Other Finished Material

Demand for cast iron pipe has fallen off during the past two weeks and awards this week totaled 502 tons, bringing the aggregate for the year to 63,290 tons as compared with 62,668 tons for the same period a year ago. Movement of oil country goods and standard steel pipe is improving, but no large pipe line inquiries are up for figures.

Seattle Awards Increase

Seattle, Sept. 26.—While activity was only normal in the Pacific Northwest steel market this week, awards were above the average. Structural contracts involving about 900 tons were announced while the largest reinforcing award of the week totaled 575 tons.

Both local mills report unchanged operations. There is a fair aggregate of new business, most of it in car lots. The largest award of the week, 575 tons of reinforcing bars, went to the Pacific Coast Steel Co. This material is to be used in three new military buildings at Fort Lewis, Chrisman & Snyder, Seattle, having the general contract at $502,000. About 20 tons of structurals will be required. Northwest Steel Rolling Mills report having booked 50 tons for the Cashmere bridge and several smaller jobs of 30 tons or less. Mill prices of merchant bars are unchanged at 2.35c while reinforcing is on a basis of 2.20c.

Plates are unchanged at 2.25c. Seattle is planning two large water system projects to be undertaken before the end of the year. For one of these jobs $2,000,000 is available. Heavy tonnages of plates will be required, it is expected. Bids will be opened Oct. 10 for a water supply system at Hood River, Oreg., 17½ miles of pipe line and it is estimated 1200 tons of plates will be required.

Structurals are firm and unchanged at 2.35c. The largest shape contract of the week went to Isaacson Iron Works, 438 tons involved in the proposed government hangar at Sand Point, Seattle. Western Construction Co., Seattle, has the general contract.

Gear Manufacturers To Meet in Buffalo

The semiannual meeting of the American Gear Manufacturers association will be held in Hotel Statler, Buffalo, Oct. 11-13. Six general sessions have been arranged at which the reports of the various committees of the association will be presented and several addresses will be given. An inspection trip will be taken to the Covert Gear & Mfg. Corp., Lockport, N. Y. The following is a resume of the program as announced:

Thursday, Oct. 11

10:30 a. m.—First general session. Address of welcome by president. Committee reports and officers' reports.
12:00 noon—Luncheon.
1:45 p. m.—Second general session.
"The Effect of Arc Welding on Manufacturing," by J. F. Lincoln, vice president and general manager, Lincoln Electric Co., Cleveland.
Committee reports.
4:30 p. m.—Meeting of industrial group.
7:00 p. m.—Third general session.
"The Niagara Frontier," by S. B. Botsford, manager, board of commerce, Buffalo.
Technical standards meeting.

Friday, Oct. 12

9:00 a. m.—Fourth general session.
"Nitration of Steel," by W. H. Phillips, Molybdenum Corp. of America, Pittsburgh.
Committee reports.
11:00 a. m.—Meeting of automotive group.
7:30 p. m.—Fifth general session, a joint session with the machine shop practice division of the American Society of Mechanical Engineers.
"High Speed Turbine Gearing," by Ira Short, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Method of Finishing Gears by the Barnes Gear Shaving Process," (illustrated) by H. D. Tanner, Pratt & Whitney Co., New York.

Saturday, Oct. 13

9:30 a. m.—Sixth general session.
"Predetermining Quality Gearing," by Russell M. Coldwell, Fellows Gear Shaper Co., Springfield, Vt.
Further committee reports and adjournment.

Additional Exhibitors at Metal Exposition

Commercial Museum, Philadelphia, this week is the scene of activity on the part of manufacturers who are installing exhibits for the Tenth National Metal Exposition held by the American Society for Steel Treating, which will open Monday, Oct. 8.

To the list of exhibitors which appeared on Pages 758 and 759 of the Sept. 27 issue of IRON TRADE REVIEW, should be added the following, which were inadvertantly omitted:

	Space No.
Ajax Electrothermic Corp.	32
American Gas Association	Gas section
American Manganese Bronze Co.	263
American Steel & Wire Co.	98
Atlantic Steel Castings Co.	314-316
Atlas Steel Corp.	77
Automatic Nut-Thread Corp.	178
Automotive Industries	208
Bausch & Lomb Optical Co.	216
Bell & Gossett Co.	117
Brinton, H., Co.	309
Bristol Co.	21
Brown Instrument Co.	116
Brown, D. P., & Co.	277A
Brown Lynch Scott Co.	228
Budd, Edward G., Mfg. Co.	168
Carpenter Steel Co.	171
Case Hardening Service Co.	117
Chicago Steel & Wire Co.	137
Colonial Steel Co.	279-280
Crucible Steel Castings Co.	314-316
Cyclops Steel Co.	164
Danly Machine Specialties Inc.	243-245
Deemer Steel Casting Co.	314-316
Disston, Henry, & Sons Inc.	274
Dodge Steel Co.	314-316
Duriron Co.	169
Electric Arc Cutting & Welding Co.	141
Elkon Inc.	142-144
Emery-Tatnall Co.	217
Empire Steel Casting Co.	314-316
Federal Machine & Welder Co.	105
Frew Machine Co.	275A
Fusion Electric Welding Corp.	137
Gathmann Engineering Co.	259-260
General Electric Co.	53-58
General Insulating & Mfg. Co.	235
Gibb Welding Machines Co.	102A
Giddings & Lewis Machine Tool Co.	206
Globar Corp.	29
Gray Iron Institute	324
Harrington Co.	261
Hartford Machine Screw Co.	246
Hayes, C. I.	28
Heintz Mfg. Co.	108
Herron, James H., Co.	61
Houghton, E. F., & Co.	121-126
John Illingworth Steel Co.	247
Illinois Steel Co.	204-205
Jessop, William, & Sons Inc.	152
Jones Machine Tool Works Inc.	223
Kenworthy, Charles F., Inc.	225
Keystone Drawn Steel Co.	299A
Kinite Corp.	179
Lavino, E. J., & Co.	81-82A
Leitz, E., Inc.	281-282
Linde Air Products Co.	109, 145 and 146
Marburg Bros. Inc.	238
Midvale Co.	222
Milburn, Alexander, Co.	127 and Gas section
Millbury Steel Foundry Co.	336
Morgan Steel Co.	237
Morris, Wheeler & Co., Inc.	99
National Electric Light Association	182-218
New Departure Mfg. Co.	190
Norton Co.	51
Nuttall, R. D., Co.	135
Owen Electric Mfg. Co.	140
Page Steel & Wire Co.	103
Peerless Machine Co.	278
Pennsylvania Electric Steel Casting Co.	314-316
Peoples Gas Light & Coke Co.	Gas section
Reeves Pulley Co.	176
Reines, Charles	17A
Riehle Bros. Testing Machine Co.	291
Riverside Steel Casting Co.	314-316
Rockwell, W. S., Co.	63
Roebling, John A., Sons Co.	91
Shenango-Penn Mold Co.	227
Siemek Tool & Die Co.	287A
Smith Welding Equipment, Eastern Corp.	140
Steel Casting Development Bureau	314-316
Steel Publications, Inc.	172
Steinmetz Electric Furnace Co.	68
Sullivan Machinery Co.	336 and Gas section
Temple University	305
Thermist Co. Inc.	287
Thomas, R. D., & Co.	100, 102, 102A
Timken Steel & Tube Co.	232-234
Torchweld Equipment Co.	176
Treadwell Engineering Co.	314-316
Transportation Engineering Corp.	100
Unishear Co. Inc.	207
Wickwire Spencer Steel Co.	107
Young Bros. Co.	233
Ziv Steel & Wire Co.	235

Abrasive Wheel Makers Meet at Lenox

The annual meeting of the Grinding Wheel Manufacturers association of the United States and Canada was held at the Wyndhurst Country club, Lenox, Mass., Sept. 28-29. At the business session Friday morning, Henry Duckworth, Norton Co., Worcester, Mass., occupied the chair.

The standardization committee, which includes George Chormann, Carborundum Co., Niagara Falls, N. Y., chairman, W. R. Moore, Norton Co., and L. E. Byers, Abrasive Co., Philadelphia, has just completed a thorough and comprehensive revision of the Simplified Practice Bulletin, No. 45, giving standard sizes and shapes of grinding wheels. This bulletin is issued under the authority of the department of commerce, Washington, and will be available for distribution shortly.

At the annual dinner Friday evening, Sept. 28, James A. Emery, Washington, counsel for the National Founders association and the National Association of Manufacturers, gave an address in which he outlined a philosophy for modern American business.

Plate Orders Increase

Washington, Oct. 2.—New orders for fabricated steel plate in August totaled 47,245 tons, compared with 36,163 tons in July, according to statistics of the department of commerce.

Seek First Quarter Iron

(*Concluded from Page* 855)

for shipment from a lake furnace is $18, base, and in lower Michigan $18.50, base.

Sales of basic are lacking. While it is reported a central Ohio steelworks offered $17, valley, for a substantial tonnage without a taker, a merchant furnace interest continues to quote $16.50, valley, and has more than sufficient to cover all reported inquiries.

Philadelphia, Oct. 2.—Pig iron sales are restricted to small and moderate tonnages of foundry iron. Specifications for shipments on contracts, however, are heavy. Producers are well supplied with orders and some important interests are not soliciting business, having all they can do to ship against their contracts. Foundry iron is firm at $20, base eastern Pennsylvania furnace.

Pulaski Iron Co.'s furnace at Pulaski, Va., was put out of blast Sept. 21 following a run of two years, seven months and 17 days. The furnace has a stock of about 51,000 tons of iron on hand production will not be resumed until its stock pile is liquidated, not expected for six or seven months. No pig iron now is being produced in Virginia.

Detroit, Oct. 2.—Orders for pig iron are numerous, although small individually in size. Nobody is stocking ahead. The trade now is all under cover for fourth quarter and while the initial price some weeks ago was $17.50, this later was advanced to $18. A second advance was inaugurated, making the current price $18.50, base furnace. Stove and furnace requirements are increasing. Automotive needs are as heavy as ever.

Chicago, Oct. 2.—Pig iron users are showing increasing interest in contract purchases for first quarter of 1929. Furnaces are not actively seeking first quarter business at this time. Spot sales are at a high mark, but contract activity is lighter as contract buyers have largely covered their primary needs for fourth quarter. Adjacent markets continue strong, making the local market firm. St. Louis district pig iron competes in southern and central Illinois, but is kept within a more closely defined market territory gaged by freight rates and the price of Chicago furnace iron. The price of $18.50, base, Chicago furnace, holds steadily for spot and future business.

September shipments of pig iron are estimated at 15 per cent above August. Furnaces still are shipping from stocks which are the lowest in many months. Several good orders for charcoal iron have been closed.

Cincinnati, Oct. 2.—Inquiries under consideration include 6000 tons of malleable for first half delivery; 1500 tons of foundry iron for first quarter, and 500 tons for first quarter. A representative of a southern furnace reports sales of 1000 tons of southern foundry in Ohio, Kentucky and Indiana, in orders of 100 tons up to 500 tons, at $16.25, base, Birmingham. Prices generally are unchanged.

St. Louis, Oct. 2.—The pig iron situation is decidedly favorable from the seller's viewpoint. Melters apparently want their iron, and September shipments reached a higher total than in August, and were well above the corresponding period last year. Seven foundries in this district now are engaged in extension work, adding to floor space and facilities. Sales during the past several days amounted to about 12,500 tons. The St. Louis Gas & Coke Co. booked 10,000 tons, including 2000 tons of basic, and a single order of 4300 tons of foundry iron for a manufacturer of heating apparatus. Prices are firm.

Birmingham, Ala., Oct. 2.—The probable output of pig iron for several weeks is fairly well covered. Deliveries continue brisk. Production will be increased this week when the Woodward Iron Co. will blow in its fourth furnace. Prices continue firm.

Toronto, Ont., Oct. 2.—Between 80 and 90 per cent of those who place contracts for pig iron are now covered to the end of the year. The demand on spot account continues in good volume. September sales, both for spot and future delivery, marked a new high monthly average for this year. Prices are firm.

11 More Blast Furnaces Make Iron

CONTINUING the improvement started in August, the coke pig iron production rate in September made another small gain. Accompanying the gain in tonnage was a good increase in operating blast furnaces. On Sept. 30 the total number of operating stacks was 194, this figure comparing with 183 stacks on Aug. 31. During September pig iron production amounted to 3,063,530 gross tons. This was a loss of 74,465 tons from the 3,137,995-ton output of the previous month. September, however, had only 30 days, against 31 in August.

The average daily production of pig iron in the month just closed was 102,117 tons, which compared with the 101,193-ton rate of August, was a gain of 924 tons per day, or 0.9 per cent. In September, 1927, the daily rate was only 92,750 tons per day and this was a recession from the August, 1927, rate of 95,183 tons.

Of the 194 blast furnaces active at the end of September, 41 were merchant and 153 was nonmerchant or steelworks stacks. The totals for August were 38 and 145, respectively.

During September, 5 merchant stacks were blown in and 2 blown out; of the nonmerchant class, 10 were blown in and 2 blown out.

Stacks blown in during September were: In Ohio: Haselton, Republic Iron & Steel Co. In Pennsylvania: Brooke, E. & G. Brooke Iron Co.; Clairton, Carnegie Steel Co.; Midland No. 2, Pittsburgh Crucible Steel Co.; Monessen No. 1, Pittsburgh Steel Co. In New York: Buffalo No. 4, M. A. Hanna Co. In Alabama: Woodward No. 3, Woodward Iron Co.; Fairfield No. 6 and Bessemer, Tennessee Coal, Iron & Railroad Co.; Alabama City, Gulf States Steel Co. In Colorado: One Minnequa, Colorado Fuel & Iron Co. In Illinois: One Federal, By-Products Coke Corp.; Joliet No. 4, Illinois Steel Co.; Iroquois No. 4, Youngstown Sheet & Tube Co. In Indiana: Gary No. 10, Illinois Steel Co.

Stacks blown out during the month were: In Pennsylvania: Keystone, Reading Iron Co. In Virginia Pulaski, Pulaski Iron Co. In Illinois: South Works No. 8 and Joliet No. 3, Illinois Steel Co.

Rate of Operation

(Relation of Production to Capacity)

	1928†	1927*
Sept.	75.2	65.9
August	74.4	67.6
July	73.2	67.7
June	76.0	73.2
May	78.3	77.7
April	78.0	81.2

***Based on coke pig iron capacity of 51,379,400 gross tons as of Dec. 31, 1926. †Based on capacity of 49,605,720 tons as of Dec. 31, 1927. Capacities computed by American Iron and Steel institute.**

MONTHLY PRODUCTION

	1928	1927	1926	1925
Jan.	2,855,515	3,101,346	3,319,789	3,372,207
Feb.	2,898,668	2,940,604	2,923,850	3,214,067
Mar.	3,199,175	3,482,107	3,458,171	3,571,422
April	3,181,975	3,424,377	3,438,805	3,211,235
May	3,292,790	3,391,067	3,477,820	2,933,907
June	3,082,340	3,089,726	3,232,478	2,679,045
July	3,072,711	2,954,625	3,224,663	2,665,262
Aug.	3,137,995	2,950,674	3,200,723	2,707,171
Sept.	3,063,530	2,782,500	3,163,269	2,725,885
Total 9 mos.	27,783,699	28,117,026	29,439,568	27,080,201
Oct.	.....	2,812,015	3,334,206	3,017,889
Nov.	.....	2,661,863	3,237,992	3,023,257
Dec.	.....	2,698,208	3,089,175	3,249,057
Total	.....	36,289,112	39,100,941	36,370,404

AVERAGE DAILY PRODUCTION

	1928	1927	1926	1925	1924
Jan.	92,113	100,043	107,039	108,781	97,273
Feb.	99,954	105,021	104,423	114,788	105,987
Mar.	103,199	112,326	111,554	115,207	111,787
Apr.	106,066	114,146	114,627	107,041	107,537
May	106,219	109,388	112,187	94,642	84,515
June	102,745	102,991	107,749	89,301	67,427
July	99,120	95,311	104,021	85,976	57,531
Aug.	101,193	95,183	103,249	87,328	60,741
Sept.	102,117	92,750	105,442	90,862	68,454
Oct.	.....	90,710	107,555	97,351	79,419
Nov.	.....	88,728	107,933	100,775	83,832
Dec.	.....	87,039	99,651	104,808	95,367
Ave.	101,400	99,422	107,126	99,645	84,908

DIVISIONS OF PRODUCTION

1927	Merchant	Nonmerchant	Spiegel and ferromanganese
Jan.	745,766	2,355,580	40,330
Feb.	642,804	2,297,800	31,605
March	762,354	2,719,753	35,488
April	735,385	2,688,992	37,657
May	701,582	2,689,485	38,531
June	714,268	2,375,458	39,764
July	736,707	2,217,918	35,768
Aug.	667,104	2,283,570	30,388
Sept.	651,246	2,131,254	26,712
Oct.	688,880	2,123,135	24,763
Nov.	652,237	2,009,626	24,372
Dec.	660,616	2,037,592	27,809
Total	8,358,949	27,930,163	393,177
1928			
Jan.	649,654	2,205,861	32,510
Feb.	579,298	2,319,370	27,376
March	597,106	2,602,069	34,587
April	586,045	2,595,930	33,599
May	596,664	2,696,126	38,466
June	589,127	2,493,213	38,628
July	584,611	2,488,100	42,230
Aug.	563,510	2,573,485	33,585
Sept.	572,958	2,490,572	31,162

SEPTEMBER PIG IRON PRODUCTION

	No. in blast last day of month Sept.	Aug.	—Total tonnage made— Merchant	Nonmerchant	—Totals— Sept.	August
Ohio	45	44	100,372	673,778	774,150	825,622
Pennsylvania	64	61	109,322	870,430	979,752	982,548
Alabama	20	16	104,294	91,159	195,453	186,724
New York	12	11	63,758	105,899	169,657	175,308
Illinois	16	15	102,457	204,283	306,740	308,865
Colorado	3	2				
Indiana	14	13				
Maryland	5	5	14,689	406,920	421,609	436,412
Virginia	1	2				
Wisconsin	0	0				
Kentucky	2	2				
Massachusetts	1	1				
Tennessee	2	2	27,103	89,905	117,008	119,346
Utah	1	1				
West Virginia	3	3				
Michigan	3	3				
Minnesota	2	2				
Missouri	0	0	35,964	30,960	66,924	67,128
New Jersey	0	0				
Texas	0	0				
Spiegel and ferro—all states	....	....	14,999	17,238	32,237	35,042
Total	194	183	572,958	2,490,572	3,063,530	3,137,995

Here and There in Industry

Timely Information Which Records Developments in Various Lines of Productive Enterprise

LATROBE TOOL CO., Latrobe, Pa., which recently acquired the business of the J. M. Carpenter Tap & Die Co., Pawtucket, R. I., now is operating the latter organization under its own management and the products of the two companies are being marketed through one direct sales organization. The Carpenter company manufacturers high speed and carbon taps and dies, while the Latrobe company manufacturers high speed twist drills and reamers. The former is the oldest established maker of taps and dies in America. The two companies maintain branch warehouses in important cities. R. S. Carter is president of the Latrobe Tool Co.

* * *

FERRY MACHINE CO., Kent, O., is building an addition to its plant, to be completed by Nov. 1.

* * *

MONROE AUTO EQUIPMENT CO., Monroe, Mich., is installed in its new plant and production has increased to more than 15 tons daily.

* * *

PEERLESS PRESSED METAL CORP. has opened a new plant at Watertown, Mass., and is expected to be under full production shortly.

* * *

STERLING BRONZE CO., 201 East Twelfth street, New York, has moved its offices and factory to 23-10 Bridge Plaza South, Long Island City, N. Y.

* * *

MARLIN FIREARMS CO., New Haven, Conn., is installing new machinery and will add 75 workmen in a program which involves new products.

* * *

CANADIAN BRONZE LTD., Box 160 Montreal, Que., has changed its name to the Montreal Bronze Ltd., with offices at 999 Delorimier avenue, Montreal, Que.

* * *

ELECTRIC HOUSEHOLD UTILITIES CORP., Chicago, will build a $200,000 addition to its plant at West Twenty-second street and South Fifty-fourth avenue. The company is successor by change of name to the Hurley Machine Co. The addition will be two stories, 80 x 400 feet, and will house the assembling and shipping departments.

* * *

STAR MACHINE & TOOL CO., Cleveland, has added ten punch presses, six milling machines, two four-spindle drills, a two-spindle drill and five single drills. The company now is equipped for fine production work and light metal stamping.

* * *

LINDE AIR PRODUCTS CO., New York, has started production of oxygen at its new plant, 125 Settlement road, Akron, O. This plant will supply surrounding territory. This is the fifty-fourth plant established by the company.

* * *

MARINE ROTARY VALVE MOTORS CO., Portland, Oreg., has leased a plant at 341 East Thirty-third street, North, and will install equipment for the manufacture of marine and truck engines, using rotary valves.

* * *

EAST AKRON MACHINE CO., Akron O., manufacturer of rubber molds, industrial equipment and general machine work, has reorganized with J. T. Seidel president and general manager and F. F. Seidel secretary and treasurer.

* * *

SAUNDERS & FRANKLIN, analytical and consulting chemists, 184 Whittier avenue, Providence, R. I., have dissolved partnership effective Sept. 29. Mr. Saunders will continue in business as Walter M. Saunders, 184 Whittier avenue, and Mr. Franklin as the Franklin Laboratory, 589 Atwells avenue, Providence, R. I.

* * *

BENNETT PUMPS CORP., Muskegon, Mich., and Service Station Equipment Co. Ltd., Canada, have been merged. The Muskegon company will take over sales in the United States of pumps made by the Canadian company. The personnel of the companies will not be changed at present.

* * *

HANSON-VAN WINKLE-MUNNING CO., Matawan, N. J., held its annual sales convention at the Berkeley-Carteret hotel, Asbury Park, N. J., Sept. 11-15. Papers of subjects pertinent to the company's business were read by members of the staff and addresses were made by several engineers.

* * *

UNIVERSAL WIRE MACHINERY CO. and the Wire Machinery Corp. of America, New Haven, Conn., have merged, and operations of both plants are expected to be concentrated at one.

* * *

ALUMINUM CO. of America has started construction at its Massena, N. Y., plant of a mill building 150 x 1000 feet, to be equipped with a 36-inch blooming mill and a 24-inch structural mill. This, it is said, will be the largest equipment in the world for rolling aluminum.

The blooming mill will be powered by a 5000-horsepower, direct-current reversible motor and will roll 24 x 24 x 72-inch ingots. The output will consist of 4 x 4-inch and 6 x 6-inch billets for the company's rod mills, structural blooms for structural mills, and sheet slabs for its sheet mills. The structural mill will be 24-inch, 5-stand 3-high mill with traveling tables, and will roll all shapes up to 12 inches with a maximum length in the finished product of 85 feet.

* * *

JOHN L. CUMMINGS CO., has been organized for the manufacture of various types of foundry refractories and foundry specialties at St. Joseph, Mich. Among the refractory products will be plastic linings, high temperature cements, melting furnace linings, patching materials, etc. Work will soon start on the plant at St. Joseph, the first unit of which will be 66 x 100 feet, a similar unit to be erected later. It is planned to start operations late in December. John L. Cummings is president and treasurer, and J. R. Osterberg, of the First National bank, Riverside, Ill., is secretary. Mr. Cummings has been with the S. Obermayer Co., Chicago, for the past ten years, having been manager of the refractory department of that concern. He formerly was with Quigley Furnace Specialties Co. and is secretary of the refractory committee of the American Foundrymen's association, and

secretary of the joint committee on refractory materials.

* * *

U. S. RADIATOR CORP. has purchased the Pacific Steel Boiler Corp., Seattle, and business will be combined at 1248 First avenue south.

* * *

GEORGE L. BARNES BRASS FOUNDRY, Everett, Wash., is negotiating for a site at Centralia, Wash., and plans to move its plant there.

* * *

M. H. DETRICK CO., Chicago, has appointed Ash Engineering Co., 1021 Chamber of Commerce building, Cincinnati, its representative in that territory.

* * *

DOMINION BRIDGE CO., Montreal, has bought the McGregor-McIntyre Structural Steel Ltd., Toronto, as a going concern and will continue it in operation.

* * *

FOOTE BROS. GEAR & MACHINE CO., Chicago, has appointed A. H. Tischer, 704 North Alabama street, Indianapolis, its representative in Indiana south of Fort Wayne and including Louisville, Ky.

* * *

HAHN MFG. CO., Cleveland, will have its addition completed early in October. It has bought a 7½-ton crane from the Euclid Crane & Hoist Co., Euclid, O. New grinders have been installed and the company is in the market for a planer, lathe and drill press.

* * *

TRANSUE & WILLIAMS STEEL FORGING CORP., Alliance, O., has elected H. O. Barker chairman of the board, J. H. Gorman vice president and general manager, and Henry Rowland director to succeed W. G. Curtis. Mr. Barker is a member of Jesup & Lamont, New York.

* * *

MOTZNIK BROS. PATTERN WORKS, Cuyahoga Falls, O., has passed to the sole ownership of R. Motznik, who has begun the manufacture of barbecue ovens for gas and charcoal use. The manufacture of wood and metal patterns is being continued.

* * *

BURKE ELECTRIC CO., Erie, Pa., has elected James Burke chairman of the board, succeeding Isadore Hernsheim, New York, who had been chairman since the formation of the company in 1906 until his death in August. George H. Winkler was elected president, R. W. De Lancey vice president, G. Irving Blake treasurer, Charles H. Schum secretary and C. J. Gibson assistant secretary. The company manufactures electrical equipment.

* * *

CANADIAN STEEL CORP. LTD., Ojibway, Ontario, has begun installation of equipment for the production of electrically welded wire mesh for use in concrete reinforcing. This company also is installing equipment for the manufacture of wire fence and fence posts.

* * *

INTERNATIONAL OXYGEN CO., Newark, N. J., has taken over the business of the Tariffville Oxygen & Chemical Co., Tariffville, Conn. The Tariffville Oxygen Co. has been formed to conduct the business as a division of the International company. Oxygen, hydrogen and acetylene will continue to be manufactured and other products of the International company will be handled also.

* * *

DOEHLER DIE CASTING CO., Batavia, N. Y., has purchased the Metal Mold Castings Co., which operates a plant in Winchester avenue, Buffalo, and will move the latter's production to Batavia early in 1929. The Doehler company will use metal mold processes to produce heavy aluminum castings in its Batavia plant and plans enlargement of production.

* * *

JOSEPH T. RYERSON & SON INC., steel warehousemen, have bought the plant, stock and goodwill of the E. P. Sanderson Co., Third, Binney and Munroe streets, Kendall square, Cambridge, Mass. The Ryerson company has been operating on leased property at 675 Concord street, Cambridge, since May 1, 1926. Acquisition of the new plant will give a large increase in plant facilities and facilitate service to steel consumers.

* * *

DAVID LUPTON'S SONS CO., Philadelphia, is completing the first unit of its branch plant in Chicago, which will be ready for occupancy by Nov. 1. It is 150 x 500 feet and is located at 5733 West Sixty-fifth street. The plant is planned eventually to cover 300 x 1000 feet. The building is steel frame construction with the company's own window frames in sidewalls and roof truss.

* * *

LANGE PORTABLE ELECTRIC WELDING CO., Cuyahoga Falls, O., has completed its new plant, containing 7800 square feet of floor space. This will be used for the manufacture of welded structural parts, continuing its former line of boiler and other welding, metal gaskets and gear guards. The company is preparing to enter the field of structural welding during the next year. Its own new plant is welded completely.

* * *

SUPERIOR SCREW & BOLT MFG. CO., Cleveland, has completed its new warehouse with 16,000 square feet of floor space. The company's engineers have designed a new type of bin of large capacity. New equipment for the manufacture of screws and bolts has been installed.

* * *

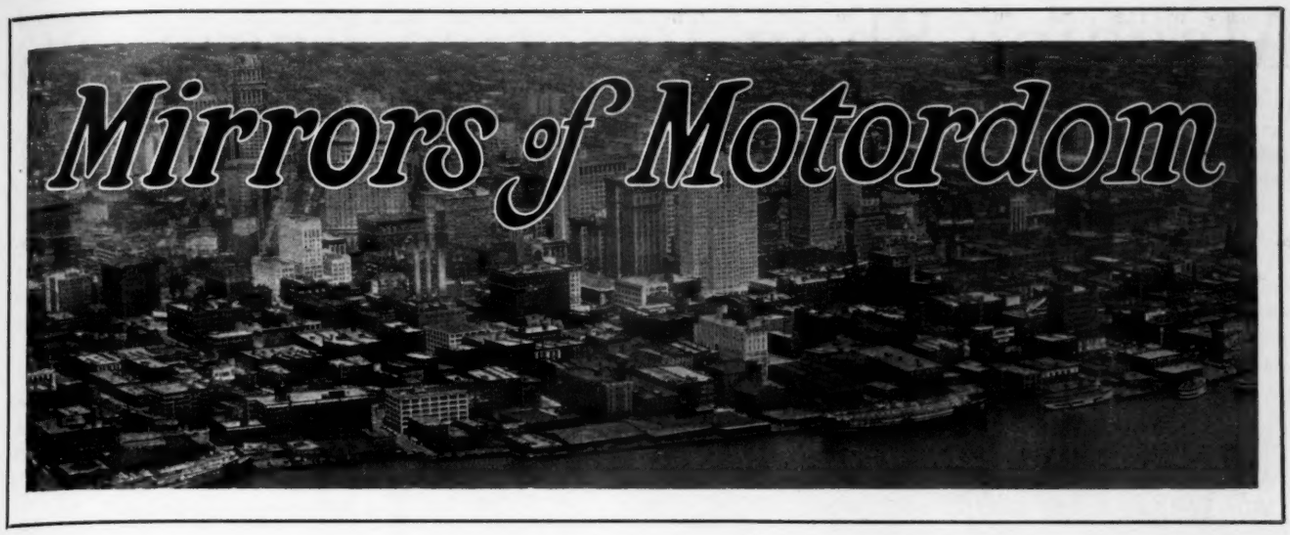
KROESCHELL BOILER CO., Chicago, has been formed to take over the boiler manufacturing business of the Brunswick-Kroeschell Co. The new company has bought the complete inventories, drawings, records, boiler-making machinery and has leased the boiler plant of the Brunswick-Kroeschell Co. The new company will operate as a distinct organization but the Brunswick-Kroeschell Co. has a stock ownership interest, represented by S. B. Carpenter, New Brunswick, N. J., and A. H. Goelz, Chicago, who are vice presidents and directors. This company also has taken the eastern sales agency for the product of the new company. The full line of water-tube and greenhouse boilers will be manufactured.

Prize Offered for Best Advertising Campaign

Harvard advertising awards committee of the National Industrial Advertisers association announces the annual Bok award of $2000 for the best industrial advertising campaign for 1928 appearing in newspapers and periodicals. Closing date is Dec. 31, 1928.

To enter competition, industrial advertisers must submit a manuscript describing the campaign, its functions and its application, reproductions of the ads as they appeared and a statement of the analysis of the market on which the campaign was founded. The manuscript and the ads must be submitted in certain prescribed form, the details of which can be secured direct from Harvard graduate school of business, Soldiers' Field station, Boston, or from A. H. Oberndorfer, chairman N.I.A.A. awards committee, care Sivyer Steel Casting Co., Milwaukee.

Export shipments of excavating machinery, including power shovels, for seven months of 1928 were $3,987,000, compared with $2,413,000 for the corresponding period of 1927.



Michigan Steel Needs Unabated; Purveyors Render Splendid Delivery Service; Auto Output Expands

* * * * * * * * *

Detroit, Oct. 2.

UNABATED demand for steel from what has become one of the greatest steel consuming centers in the world seems to be assured for some time, unless all signs fail of materialization. Low inventories have become a fetish, small lot buying a religion and demands for quick shipment a ritual. At the shrine of limited stocks, all steel consumers worship and this obtains not alone in the automotive and allied lines but in every other consuming line as well. Important pig iron sellers have made a canvass of stocks in the hands of their customers and say that if for two weeks they would make no shipments whatever and in the interim existing stocks could be equalized among melters, not a pound of iron would be on hand at the end of that time. One motor foundry in Flint, Mich., where the cupolas melt 800 or 900 tons daily, aims only to keep a 6-day supply of iron ahead. Smaller users of steel as well as iron specify a carload or two at a time and often the danger line not only is reached but is passed. Supply sources then have to engage in much telephoning, telegraphing, car-tracing, etc. In fact it is becoming increasingly common in the case of wanted steel shipments, to send out personally conducted cars of material to see that nothing interferes to check the rushing of the material to its destination. Service, always a watchword in the steel industry, is being worked overtime in the Detroit area and almost unbelievable things are being accomplished in its rendition.

* * *

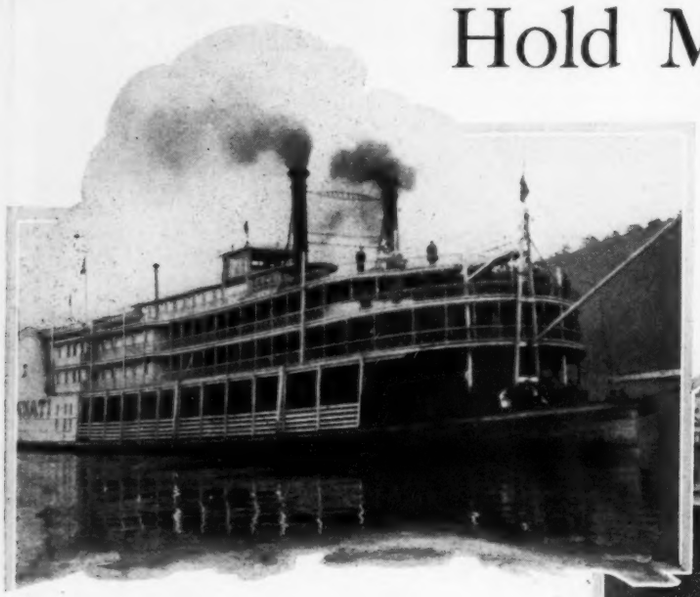
DO THE buyers remember the extraordinary service they thus are receiving? "Not by a jugful," say the steel salesmen. Long time connections mean absolutely nothing. Splendid delivery service in times of need and stress are immediately forgotten when new orders come to be placed. The fellow with the lowest price wins or one who will waive an extra or make some other minor concession. Each fresh order immediately is placed upon a competitive basis and the competition is as cold as charity, a cut and dried, cold-blooded, take-it-or-leave-it, proposition. In this respect, say the go-betweens—the buffers between the mills and the manufacturers, the Michigan territory is different from any other in the world.

* * *

IN EXCESS of 35 per cent of the steel sheets, strips, etc., made in the United States, is consumed in the greater Detroit area, which includes much of Michigan, with fringes of Ohio, Indiana and Illinois. Is it any wonder then that such a decided objection was raised and registered against the inauguration of new cash discount terms of ½ of 1 per cent replacing 2 per cent? Why, for one large motor manufacturer (who incidentally is still a hold out—practically all the other large automobile and stamping companies are in line as having accepted the new regime) the difference amounts practically to $1,000,000 annually. No one can blame him for being disinclined to relinquish that much money and in endeavoring to hold his large tonnage as a club over the heads of the sheetmakers. The latter, however, are more unified on this subject than ever they have been on any point. No one wishes to be the one to break traces. Each realizes that to do so in one case would mean the disintegration of the structure they have builded and the nullification of all the missionary work done so far. The manufacturer in question, say they, soon will need material and he with all the rest will have to abide by the new terms. Some of those now in line, accepted the new order of things with poor grace. A number even offered to pay $2 and even $3 per ton above the market (in the case of full finished sheets, this would be 4.10c or 4.15c base instead of 4.00c) if they could retain the old 2 per cent cash discount clause. These offers of course were refused by the sheetmakers. They say, the thing is economically sound, there is no reason why one flat rolled product such as hot strips should have ½ of 1 and another, such as cold strips should have a different unit such as 2 per cent. The cash discount should be uniform and now, having set their hand to the plow, they will not turn back.

More than 50 men have been added to the force of the Bessemer Gas Engine Co., Grove City, Pa., as a result of large orders recently.

Machine Shop Practice Engineers Hold Meeting on Ohio River Steamer



(Left)—River steamer CINCINNATI *approaches Ashland, Ky. (Below)—The engineers go ashore*

IN CONDUCTING its second national meeting, the machine shop practice division of the American Society of Mechanical Engineers adopted a somewhat novel plan. About 225 members and guests congregated in Cincinnati on Sept. 24 and in the early afternoon embarked on the river steamer CINCINNATI for a 150-mile trip up the Ohio river to Ashland, Ky., where on the following day they were guests of the American Rolling Mill Co. in an inspection of that company's new continuous sheet rolling process. After several pleasant and profitable hours in Ashland, the party re-embarked for the return down stream, arriving at the starting point on Wednesday noon, Sept. 26.

The program provided ample time for recreation and business. Deck sports and bridge tournaments were engaged in during the two afternoons spent on board. A symposium on aeronautic machine shop problems was held on the first evening and another on lubrication occupied the time on the second evening. A third symposium on machine tools in modern manufacturing was started on board on Wednesday morning and was concluded at a luncheon at Hotel Sinton at noon. Wednesday afternoon and all day Thursday were devoted to plant visitation.

It is probable that the next annual meeting of the division will be held in Cleveland in the fall of 1929, in connection with the National Machine Tool Builders' exposition.

Airplane Engine Parts Get Rigid Inspection

SHORTLY after 2 o'clock on Monday afternoon the CINCINNATI pulled away from the dock and pointed her bow up the Ohio river. Within a few minutes the interest of the passengers became divided between sightseeing and entertainment features. Many chose to occupy deck chairs or wander around the decks to observe the scenery on the Ohio and Kentucky shores, while others preferred to engage in the deck sports. Others devoted their time to bridge. Dinner was served in the dining salon at 6 p. m. and was welcome to appetites whetted keen by the chill breeze on deck.

Following dinner, the party settled down to business of a more serious nature by attending a technical session on the inside forward deck. R. E. Flanders, vice president and general manager, Jones & Lamson Machine Co., Springfield, Vt., and former president of the National Machine Tool Builders' association, presided.

"Aeronautic Machine Shop Problems," was the subject for the session and the principal paper was "Inspection Methods and Quality Control in the Manufacture of Aircraft Engine Parts," contributed by H. W. Roughly, quality manager, Wright Aeronautical Corp., Paterson, N. J. In the absence of the author, the paper was read by L. C. Morrow, managing editor, *American Machinist*, New York, and chairman of the machine shop practice division of the A. S. M. E. Mr. Roughly said, "From the time the raw material enters the factory until the finished engine is finally tested and packed for shipment, all raw material and every operation in the process of manufacture is subjected to the exacting scrutiny of a large force of specialists, men adequately trained to carry on the exact inspection found necessary through long experience in the manufacture of reliable aircraft engines."

According to the author, bar stock,

forgings, castings, etc., which will meet chemical and physical requirements and at the same time be free from seams, cracks, laps, blowholes and mis-runs, are carefully inspected upon receipt. He then related in detail the inspection given bar stock, forgings and castings and then explained the painstaking supervision and examination during manufacture. Each acceptable piece is stamped by the inspector, each inspector using his own identification number, so that any part can be traced back to the inspector. After assembly each engine is tested under power, then disassembled and all parts examined for defects. The engine again is assembled and retested before shipment.

Two papers presented at the aeronautical meeting in Wichita, Kans., were reviewed by Erik Oberg, editor, *Machinery*, New York. These contributions divulged that 140 manufacturers in this country are building airplanes, while a somewhat smaller number is manufacturing airplane engines. The rapid growth of the number of plane manufacturers is attributed to the fact that compared with the cost of the product, it is one of the least expensive lines in which to engage. The United States department of commerce is supposed to pass upon details of design, but it cannot prevent the improper carrying out of these details.

To illustrate the rapidity of getting into production, one plant in six weeks' time made one plane per day; in two months was turning out two planes per day and in three months had reached five planes per day. One manufacturer places responsibility for defects upon the workmen, particularly welders, by taking them into the air at frequent intervals in the planes which they have constructed. Mr. Oberg stated the demand is considerable for a small engine which is reliable but not costly.

Describes Continuous Sheet Rolling Process

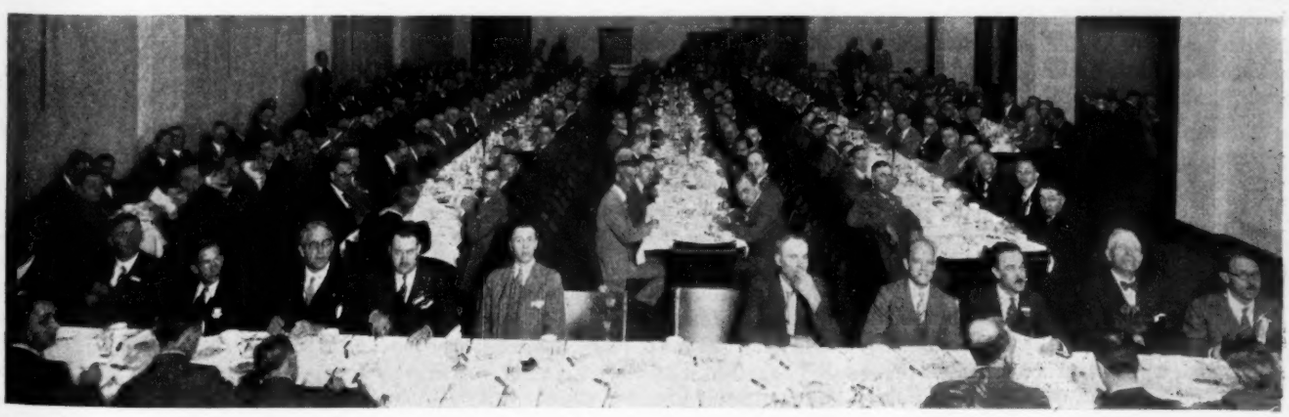
THAT the members of the party could fully appreciate their inspection trip through the American Rolling Mill Co.'s continuous sheet mill on the following day, the chairman introduced Bennett Chapple, vice president in charge of publicity for the company, who briefly described the Ashland mill equipment and its operation. Mr. Chapple traced the flow of metal from the blast furnace to the open hearth to the soaking pits to the blooming mill and then the sheet mill and being delivered as finished sheets at a rate up to 2 tons per minute. A series of articles describing this mill appeared in the June 16, June 23, June 30, July 7 and July 14 issues of IRON TRADE REVIEW. This first successful continuous sheet rolling process in the world is conceded to be an important development in the steel industry for comparatively few men can produce large tonnage almost automatically.

As the boat docked at Ashland on Tuesday morning, the party was met by about 60 guides. Private automobiles were used to drive the engineers through the city and to the plant of the American Rolling Mill Co. Over two hours were required to inspect the steel plant and rolling mills in operation. At noon the company was host at a complimentary luncheon at the First Methodist church. Approximately 300 were served. Among the speakers were J. C. Miller, vice president of the company in charge of the Ashland plant, Mr. Chapple, Mr. Flanders and Mr. Morrow. At the conclusion of the program, the guests were returned to the boat.

Lubrication Is Evening Topic

A sharp cold wind made deck sports somewhat unpleasant during the afternoon, consequently the bridge tournament inside proved popular. After dinner, the second technical session on the topic of "Lubrication" was held on the forward deck with L. C. Morrow officiating as chairman. In the first paper, "A Theory of the Lubrication of Cylindrical Bearings," F. E. Cardullo, chief engineer, G. A. Gray Co., Cincinnati, submitted an approximate physico-mathematical theory for what happens in a copiously lubricated plain cylindrical bearing. From this theory the speaker explained it would be possible to learn how best to supply the lubricant; the best forms for oil grooves; where the wear will occur on the surface of the box; why suitable clearance is necessary in a bearing; and what the general effect will be if a change is made in the load, the speed, the clearance, the viscosity of the lubricant, the length of the journal, or any other feature of design or operation. Following the complex deduction of his formula, Mr. Cardullo presented 16 conclusions on the load-carrying capacity, power loss and rise of temperature of plain bearings.

Several written discussions were read, including those of M. D. Hersey, chairman, friction and lubrication section, bureau of standards, Washington, and Prof. E. O. Waters, Yale university, New Haven, Conn., and others. All disagreed sharply with the author and pointed out that the conclusions set forth by various authorities had been entirely disregarded. His method was branded as unorthodox. In rebuttal, Mr. Cardullo claimed his assumption to be just as tenable as those formerly advanced, also just as orthodox. He further stated that for short bearings with end leakage his formula proved more



The American Rolling Mill Co. is host to almost 300 at luncheon in a local church

accurate than those of other investigators.

The second paper at this session was presented by G. B. Karelitz, research engineer, Westinghouse Electric & Mfg. Co., East Pittsburh, Pa., his subject being, "Grooving Bearings in Machines." The author confined himself to the essentials of correct lubrication and conditions which it is desirable to establish by means of grooving; and a series of examples of grooving in a classified number of applications. "Indiscriminate cutting of grooves in a bearing may be harmful," he said, "A proper cross-section of the grooves is important."

In discussion, W. H. Herschell, bureau of standards, Washington, said that the amount of lead in a bearing affects friction as much as the lubricant. Bearing metals having the most lead give the least friction, he said.

Special Fixtures Are Fabricated by Welding

BECAUSE of fog, the boat was delayed during the night and as a result the final session on Wednesday morning was called to order on board. W. W. Tangeman, sales manager, Cincinnati Milling Machine Co., Cincinnati, presided. In the opening paper, "Some Practices in the Use of Machine Tools in the Electrical Industry," J. R. Weaver, superintendent, manufacturing equipment department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., stated that in manufacturing electric apparatus, equipment must be suited for general conditions and yet adapted to high production. This can be obtained from standard tools by adapting special fixtures that will allow multiple or continuous cutting. Where the work does not warrant a single purpose machine, a standard tool equipped with a special multiple holding fixture can be used. The speaker said welded fabricated steel construction was being employed extensively in making fixtures and holding devices and possibly the method could be used advantageously in machine better adapted. The company is using die casting and hot pressing with economies.

"Machine Tools—Their Use and Application in the Railroad Industry," was the title of the second paper read by L. A. North, shop superintendent, Illinois Central System, Chicago. The speaker said that large sums of money are spent annually in making changes in machine tools and shop surroundings to keep up with the increased areas and weights of parts to be machined and maintained. The number and parts per locomotive as well as weights are constantly increasing and with this idea in view, it is all the more necessary that new ways, new methods and higher production be established to keep the cost where it should be.

In expressing the attitude of the railway toward the introduction of new tools and new methods, Mr. North dwelled briefly with grinding, milling, drilling, turning from bar stock and lapping and honing. He predicted that chromium plating would find wider use in the railroad field.

Prompted by the two papers, E. F. DuBrul, general manager, National Machine Tool Builders' association, Cincinnati, discussed the effect of new cutting materials now being placed on the market. He said that the improvements in these materials would revolutionize machine tool design. Further, the use of die castings or permanent mold castings and welded structures was reducing greatly the amount of finish machining required. He urged tool builders to prepare themselves for these changes in manufacturing methods.

Shortly before noon the boat docked in Cincinnati and the engineers departed for Hotel Sinton where immediately following luncheon, the session was resumed. Max Sklovsky, chief engineer, Deere & Co., Moline, Ill., read an interesting paper on "Machine Tools in the Implement and Tractor Industries." Metal parts, he said, are formed by two types of tools, the hammer and chisel. Under the hammer classification are power hammers and presses, while under the chisel classification are machine tools.

Demand for farm implements was lower than products in other lines, consequently mechanization was delayed. Up to 1880 machinery was not available. Between then and 1900 manufacturers developed their own special equipment. In the period from 1900 to 1915 standard tools came into wider use because of the development of high-speed steel which gave machining operations an economic position. The period starting in 1915 saw the development of special purpose equipment. The accompanying table gives some idea of the mechanization of the farm implement and tractor industries.

Use of the tractor dates back only to about 1905 and at that time only regular machine shop tools were used in their manufacture. Automotive machinery was not suitable because of the larger parts involved, thus special tools were developed. Proper lubrication is one essential of equipment for this work; another is rigidity. Mr. Sklovsky said that parts of machine tools have sufficient rigidity, but that frequently the fastening of these parts by bolts or studs is inadequate.

The concluding paper was submitted by L. I. Roberts, mechanical superintendent, Packard Motor Car Co., Detroit, the subject being "Machine Tools in the Automotive Industry." He discussed the necessity for equipment to give high production and the required accuracy. He said the policy of his company was to have the tool builder design the jigs and fixtures to be used with the machine. This method has been found satisfactory.

In the discussion which followed, J. E. Padgett, assistant to vice president and general manager, Spicer Mfg. Co., Toledo, said that his company recently had purchased a large number of high-grade machine tools and that 50 per cent lacked the required accuracy. It was necessary to rebuild parts of the machines to secure the desired accuracy. In this connection he said consumers would have greater confidence in manufacturers if salesmen were more truth-

(*Concluded on Page* 884)

Tools in Implement and Tractor Industries

Farm Implement Industry

Period	Machine Tools — No. per employe	Machine Tools — Investment per employe	Other production machines — No. per employe	Other production machines — Investment per employe
Before 1880	1/20	$ 10	1/5	$ 100
1880-1900	1/10	$ 50	1/3	$ 500
1900-1915	1/7	$100	1/2	$1000
1915-1928	1/6	$200	2/3	$2500
Tractor Industry				
1928	.....	$1500	.....	$1000

European Markets Are Firmer

British Steel Reflects Advancing Tendency Due to Heavy Order Books on Continent—Pig Iron Demand Also Shows Expansion—Hoopmakers in Germany, Belgium, France and Luxemburg Discuss Joint Action

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Oct. 2.—(*By Cable*)—Conditions in the British steel industry show considerable improvement, especially referring to billets and bars, justifying higher prices. This is due to heavy order books of continental steelmakers and their stronger price attitude. Demand for plates is lagging, while rail and merchant mills are fully employed. Hoops are active.

Galvanized sheets are firm. Good sales are reported for delivery to India. Orders for tin plate are fair, coming mainly from the Continent and the Far East. Armstrong, Whitworth & Co. have booked substantial orders from India for locomotives. Demand for British pig iron is expanding.

IRON TRADE REVIEW'S correspondent at Paris reports a favorable outlook in the French export and domestic markets. Beam prices have been raised slightly by the comptoir. The Belgian markets are active and very firm.

Orders from Japan are subsiding, while both India and China are taking more steel. An order for 1000 tons of alloy steel for delivery to South Africa has been booked by a Geman maker. Belgian, French, German and Luxemburg hoopmakers are contemplating a meeting to discuss general market conditions.

British Steelmakers Find Orders Increasing

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Sept. 21.—The market continues to be encouraged by the placing of railway work by foreign lines. It is particularly welcome at the moment as British companies have little money to spend and have cut buying to the minimum. South Africa is in the limelight again with an order for 400 steel bogie wagons given to the Leeds Forge Co., one of the subsidiary concerns of Cammell Laird & Co. It is understood that the Leeds company's tender was not the lowest but deliveries were more expeditious.

Sterling $4.85

and as South Africa has been complaining of the quality of German locomotives, it is not surprising they decided to pay a little more for British work. Another useful order is that secured by the Clyde Engineering Co. for 20 corridor cars for the New South Wales railway commissioners. In addition, a variety of smaller orders have been secured from India, Egypt and Peru by British builders during the past ten days in face of severe Continental competition.

Better conditions are to be found at all steelmaking centers, and even the shipbuilding department, which is in a bad state, has called for some steel from Middlesbrough. Plate mills, which depend to a large extent on the shipbuilding areas, are working short time. On the other hand, there is a better call for sections and other steel used by constructional engineers who are constantly using this material. Birmingham firms have exceedingly good order books covering a variety of building schemes.

In pig iron the most marked improvement is in the Middlesbrough

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, October 1	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON	£ s d		£ s d		£ s d		£ s d	
Foundry No. 3, Silicon 2.50-3.00	$16.01	3 6 0*	$15.28	3 3 0	$15.28	3 3 0	$15.76	3 5 0
Basic	15.76	3 5 0	15.28	3 3 0	15.28	3 3 0	15.28	3 3 0
Basic-bessemer	16.73	3 9 0†	14.79	3 1 0	14.79	3 1 0	14.55	3 0 0
Hematite, Phosphorus 0.02-0.05	16.73	3 9 0	22.09	565*	.....	.....	.....	3 10 0
SEMIFINISHED STEEL								
Billets	$30.31	6 5 0	$24.25	5 0 0	$24.55	5 0 0	$24.25	5 0 0
Wire rods	41.23	8 10 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.59	7 15 0	$31.53	6 10 0	$31.53	6 10 0	$31.53	6 10 0
Merchant bars	1.63c	7 10 0	1.38c	6 5 0	1.38c	6 5 0	1.38c	6 5 0
Structural shapes	1.60c	7 7 6	1.13c	5 3 0	1.13c	5 3 0	1.10c	5 0 0
Plates, ship, bridge and tank	1.76c	8 2 6	1.40c	6 7 6	1.40c	6 7 6	1.42c	6 9 0
Sheets, black, 24 gage	2.17c	10 0 0	2.34c	10 12 6	2.34c	10 12 6	2.19c	9 19 0
Sheets, galvanized, 24 gage, corrugated	2.90c	13 7 6	2.97c	13 10 0	2.97c	13 10 0	2.93c	13 6 0
Bands and strips	2.22c	10 5 0	1.57c	7 3 0	1.57c	7 3 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.60c	7 5 0	1.60c	7 5 0	1.60c	7 5 0
Galvanized wire, base	2.93c	13 10 0	1.98c	9 0 0	1.98c	9 0 0	2.01c	9 3 0
Wire nails, base	2.38c	11 0 0	1.65c	7 10 0	1.65c	7 10 0	1.65c	7 10 0
Tin plate, base box 108 pounds	$ 4.43	0 18 3	.....	.....	.....	...	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported		Francs		Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.01	3 6 0	$17.20	440(2)	$16.40	590	$18.59	78
Basic pig iron	15.76	3 5 0	18.57	475(1)	15.85	570	20.97	88
Furnace coke	3.15	0 13 0	5.87	150	5.14	185	5.12	21.50
Billets	29.10	6 0 0	21.70	555	26.41	950	28.83	121
Standard rails	1.79c	8 5 0	1.46c	810	1.63c	1,250	1.51c	140
Merchant bars	1.57c	7 5 0	1.28c	710	1.43c	1,100	1.52c	141
Shapes	1.71c	7 17 6	1.17c	650	1.19c	915	1.49c	138
Plates, ship, bridge and tank	1.87c	8 12 6	1.54c	855	1.49c	1,145	1.71c	158
Sheets, black, 24 gage	2.28c	10 10 0	2.92c	1,620	2.44c	1,880	2.43c	225
Sheets, galvanized 24 gage, corrugated	2.96c	13 12 6	3.41c	1,895	3.87c	2,975	3.78c	350
Plain wire	2.12c	9 15 0	1.71c	950	2.02c	1,550	2.48c	230
Bands and Strips	2.22c	10 5 0	1.42c	790	1.82c	1,400	1.77c	164

*Middlesbrough; †Scotch foundry iron; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £21 14s 0d ($105.25) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($72.90) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

district where activities at steelworks have absorbed nearly all the iron, leaving a small quota for the open market. A notable shipment this week was 1500 tons of spiegel to Canada, the largest for a long time. An improving demand for ferromanganese has led to shortage of supplies so that Bolckow Vaughan & Co. are considering relighting a furnace on this metal. The east coast hematite market is stronger and stocks have been liquidated during the past fortnight. Manufacturers now find little difficulty in securing business for immediate requirements while forward orders are on the whole more readily secured. The quotation is now £3 10s ($16.97), though it might be possible to get slightly better rates for a substantial tonnage for forward delivery.

On the Birmingham exchange yesterday it was evident that the movement in pig iron was not making much progress. Prices are all firm, although the demand is hardly sufficient to test them. Small parcels of foundry iron are being bought, but it is a rare instance to find a consumer contracting forward. In these isolated cases buying is being done in view of a possible rise in price, but here buyers do not want delivery yet awhile.

The market has been firm for galvanized sheets and Midland mills are booked in some cases to the end of December. A good deal of inquiry is circulating, especially with overseas markets. The minimum is now £13 10s ($65.46) and some makers are asking as much as £13 15s ($66.67). The Scottish mills making sheets are comfortably off for orders, this being the bright spot in an otherwise depressed market.

New Luxemburg Record

Brussels, Sept. 20.—(*European Staff Service*)—The highest production figures for steel ingots and castings were reached by Luxemburg in August. The August output included 222,155 tons of basic bessemer, 1722 tons of open-hearth, and 305 tons of electric steel.

The output of pig iron in August was greater than in July. The August output included 230,471 tons of basic bessemer and 3050 tons of foundry pig iron. The following table gives figures for the first eight months of 1928 as compared with the monthly averages of the three preceding years and 1913, in metric tons:

Mon. ave.	Pig iron	Steel ingots and castings
1913	212,320	111,355
1925	196,940	173,855
1926	209,295	186,980
1927	226,115	205,850
1928		
Jan.	229,602	212,939
Feb.	220,114	205,053
March	240,234	220,309
April	226,983	202,586
May	233,806	214,756
June	230,484	214,925
July	224,807	207,687
August	233,521	224,182

French Output Lower

Paris, Sept. 19.—(*European Staff Service*)—The production of pig iron in France during July was slightly under that of June. The July output included 609,000 tons of basic bessemer, 105,000 tons of phosphorus foundry, 28,000 tons of hematite foundry, 26,000 tons of gray forge pig iron, and 18,000 tons of ferroalloys.

July output of steel ingots and castings was composed of 743,000 tons of steel ingots and 14,000 tons of steel castings. From the point of view of composition, the output was composed of 532,000 tons of basic bessemer, 209,000 tons of open-hearth, 10.300 tons of electric, 4200 tons of acid bessemer, and 1500 tons of crucible steel. The following table gives figures for the first seven months of 1928 as compared with the monthly averages of the three preceding years and 1913, in metric tons:

Mon. ave.	Act. fur. on last day	Pig iron	Steel ingots and castings
1913*	131	433.940	390,580
1925	148	707.840	620,540
1926	155	785.965	702,500
1927	142	774,785	689,610
1928			
Jan.	144	809,000	753,000
Feb.	149	785,000	738,000
Mar.	149	858,000	804,000
April	150	834,000	788,000
May	150	871,000	794,000
June	148	844,000	797,000
July	148	836,000	757,000

*In pre-war boundaries.

German Steel Prices Now Yielding Fair Profit

BERLIN, Sept. 21.—(*European Staff Service*)—Export sales continue active, and it is admitted that prices now prevailing leave a fair margin of profit. A year ago export quotations for merchant bars were about 95 marks ($22.50) per ton f.o.b. Antwerp, whereas now something like 123 marks ($29.25) is obtainable. It is estimated that about 50 per cent of the total sales of rolled products is sold at home, 3 per cent is sold abroad, and 17 per cent is sold with an export rebate to consumers. As the domestic quotation of 141 marks ($83.50) for merchant bars is considerably higher than the cost of production, it will be seen that producers now make fair profits. They claim, however, that the recent increase of freight rates by 11 per cent, effective next month, will work out in an increase of costs by 2.50 to 3 marks (59c to 71c) per ton. Notwithstanding this fact, it is not expected that domestic prices will be raised, unless the workers denounce the wages agreement effective Oct. 1. Thus, some uncertainty remains, causing domestic consumers to re-enter the market to some extent, so that home sales have improved. Occupation of the German rolling mills is satisfactory, and unfilled orders average about three weeks.

A substantial volume of business is for export, although for some time the steel works association has refrained from selling abroad to avoid exceeding the quota allowed by the European raw steel association. In certain quarters it is believed that the boom on the export market is beginning to spend itself. China, Japan, and the Near East recently have been fair buyers, although American competition is reported to have been encountered in those markets. The Deutsche Edelstahlwerks Co. has booked a South African order for 1000 tons of spring steel, and E. O. Dietrich Rohrleitungsbau has obtained an order for the installation of the gas supply system of Angora.

The recent convention between American and British makers of tin plate has aroused considerable interest in this country, but it is stated that German makers will not join and that they are not interested. During the first seven months of 1928 German tin plate output aggregated 77,398 metric tons, against 75,286 tons in the corresponding period of 1927. Imports of tin plates during the period totaled 14,066 tons, compared with 12,516 tons, of which 6461 tons originated from the United States. Exports, on the other hand, amounted to 20,135 tons, against 17,931 tons, the principal countries of destination being Holland, Italy, and Switzerland.

Krupps, in collaboration with the United Steel Works Co., have established a new company under the style of Eisenschwamm G. m. b. H., in Bochum, for the purpose of making high-grade steel direct from iron ores by the Norsk Staal process. German makers of pig iron have had to blow out another blast furnace, so that 99 furnaces now are in operation compared with 116 in January; this is partly owing to competition of British iron in the coastal districts and central Germany. Consumption of pig iron has decreased on account of reduced occupation of machine makers.

August British Exports Show Improvement

Birmingham, Eng., Sept. 21.—(*European Staff Service*)—The British board of trade's return for August shows a total export of iron and steel products including scrap of 386,163 tons, compared with 352,475 tons in July and 369,987 tons in August last year.

Imports, including scrap, totaled 283.997 tons, compared with 234,299 in July and 289,084 a year ago.

In pig iron a notable expansion is that of acid quality which rose from 8457 tons in July to 13 598 tons in August. Foundry qualities, however, totaled only 13,940 tons in August, compared with 22,237 a month ago. Ferroalloys also increased from 1315 in July to 4283 in August, and improvement of the galvanized sheet trade is shown by export of 65.456 tons, compared with 51,579 in July. Similarly tin plates rose from 43 584 to 53,168 and wrought tubes from 20,237 to 24,649 tons. Other small increases are noticed in tires and axles, wheels and axles, railway material, wire and wire manufacture.

(*Concluded on Page* 889)

Industrial Men in the Day's News

I. Lamont Hughes, Vice President of the United States Steel Corp.

STARTING in the steel industry at the age of 19, *he advanced through various stages to his present responsible executive position.*

HIS early training was gained in engineering departments, which was followed by valuable experience as superintendent at various mills.

HE IS a great lover of horses and avails himself every opportunity to ride horseback. Walking to work is a form of exercise he has found pleasant.

FOLLOWING 31 years of service in the steel industry, I. Lamont Hughes, as vice president in charge of manufacturing operations of the United States Steel Corp., New York, holds one of the most responsible positions in the industry. Chief aide to James A. Farrell, president of the Steel corporation, Mr. Hughes is probably the youngest of the major executives of that organization.

Mr. Hughes was born in Mercer, Mercer county, Pa., attending the grade school there and also in New Castle, Pa. He moved to Braddock, Pa., to live with a sister and was graduated from high school there. While in high school, he was active in all sports, and at graduation time, he headed his class scholastically. Soon after leaving high school, Mr. Hughes became connected with the Edgar Thomson works of the Carnegie Steel Co., in September, 1897, working in the engineering department. He spent part of his time in the drafting room and part in the mill. Later on he was kept in the drafting room and having a tendency toward bettering himself in that line, he enrolled in a correspondence school, spending his evenings studying the lessons. In 1904 when the Donora, Pa., plant of the Union Steel Co. was completed, Mr. Hughes became associated with the company as head of its engineering department.

He remained in that capacity for four years and then returned to the Carnegie company, going to Youngstown, O., as master mechanic of the bar mills of that district. From that time, he has been with the Steel corporation continuously filling capably a number of positions.

Advancement was rapid for Mr. Hughes after 1905, and the following year he became assistant general superintendent of the bar mills. Five years later he was made general superintendent. He continued in that position until January, 1916, when he became assistant general superintendent of the entire Youngstown district. In June of that year, Mr. Hughes went to Ojibway, Ont., Canada, as general superintendent in charge of the Canadian Steel Co.'s project at that point. The work which was contemplated was held up by the war and he was transferred in June, 1918, to the Neville Island Gun plant, Neville, Island, Pa., where he was general superintendent. Following the completion of this project, he was transferred to the river department of the Carnegie company.

On May 1, 1919, Mr. Hughes was made president of the Lorain Steel Co. at Johnstown, Pa., where he remained until the start of the next year. At that time he was sent to the Youngstown district to become general superintendent of all operations of the Carnegie Steel Co.

Five years later he was elected vice president of the Carnegie company, in charge of operations and appropriations of the Western district plants, and in April of this year, he was elected to his present executive position, vice president of the United States Steel Corp. in charge of manufacturing operations.

Mr. Hughes is an ardent horseman, a lover of horses and in the saddle at every opportunity. He has found extreme pleasure in walking daily to his office.

Men of the Industry

NORMAN F. MELVILLE, manager of metallurgy and inspection of the Superior Steel Corp., Pittsburgh, resigned recently. Mr. Melville prior to his connection with the Superior corporation had been chief metallurgist of the Butler, Pa., plant of the Columbia Steel Co., since acquired by the American Rolling Mill Co.

* * *

L. J. Buck, 11 Broadway, New York, is in Europe for a stay of about six weeks.

* * *

Paul G. Leoni, of Iron & Ore Corp. of America, and William H. Muller & Co. Inc., 11 Broadway, New York, sailed Sept. 26 for Europe.

* * *

A. J. Forschner, vice president of the Atlas Conveyor Co., Philadelphia, has taken over the additional duties of secretary of the company to succeed E. A. Thumlert.

* * *

D. Walker Wear is the newly-elected president of the Stow Mfg. Co. Inc., Binghamton, N. Y., succeeding the late Clarence F. Hotchkiss. In last week's issue, this company's location was incorrectly stated.

* * *

H. D. Epting has been transferred from the Philadelphia sales office of the Wagner Electric Corp., St. Louis, to the Atlanta, Ga., sales office. R. W. Piper has been added to the transformer sales division of the company.

* * *

F. R. Fishback, president of the Electric Controller & Mfg. Co., Cleveland, has been elected vice president in charge of the apparatus division of the National Electric Manufacturers association. He was elected to the board of governors succeeding N. A. Wolcott.

* * *

P. A. Terrell, formerly manager of the new industries division of the Mississippi Power Co., has been placed in charge of the central stations and railroad sales for the Copperweld Steel Co. in Chicago. He is a graduate of the Alabama Polytechnic institute and has had much industrial experience.

* * *

F. C. McLain, president of the Reliance Mfg. Co., Massillon, O., and E. W. Hart, vice president, have retired. W. H. Crawford, secretary and treasurer has been named to succeed Mr. McLain as president and H. J. McGinn, general sales manager, has become vice president and general manager.

* * *

H. E. Chilcoat, for the past two years engaged in consulting commercial engineering work, has become associated with the Koppel Industrial Car & Equipment Co., Pittsburgh, as manager of sales of the dump car division. Mr. Chilcoat became connected with the Pennsylvania railroad

H. E. CHILCOAT

in 1900, leaving to go with the Westinghouse Air Brake Co. six years later. He was with the Clark Car Co. also, prior to his present position.

* * *

Arthur C. Tozzer, vice president in charge of the Boston territory for the Turner Construction Co., New York, has been elected executive vice president with headquarters in the main office.

William H. Nye, Boston contract manager, has been named to succeed Mr. Tozzer at Boston.

* * *

Leigh B. Morris, one of the best known steel men on the Pacific coast and for the past several years sales agent for the Bethlehem Steel Co. at Los Angeles, has resigned. Prior to going to the coast in 1923 he was New York manager of sales of Cambria Steel Co. and when the Midvale Steel & Ordnance Co. was formed, which took over the Cambria Steel Co., he was reappointed New York manager of sales for all the companies of the Midvale Steel & Ordnance Co.

* * *

J. C. Williams, vice president and general manager of the Weirton Steel Co., Weirton, W. Va., has returned from a two months' European tour.

* * *

L. S. Monroe, advertising manager of the Electric Controller & Mfg. Co., Cleveland, has resigned to become associated with the Copperweld Steel Co., Glassport, Pa.

* * *

G. Clark Mather, consulting engineer with the Graham-Paige Motors Corp., Detroit, has resigned. At one time he was chief engineer of the Paige-Detroit Motor Car Co.

* * *

James L. Donnelly, secretary of the Western Cartridge Co., East Alton, Ill., has been elected executive vice president and secretary of the Illinois Manufacturers' association, succeeding the late John M. Glenn.

* * *

D. L. Bellinger has resigned as president and superintendent of the Mount Morris Valve Corp., Mt. Morris, N. Y., and has gone to Glens Falls, N. Y., to engage in another field of work. David Swift, treasurer of the Mount Morris concern, has been placed in charge of the plant pending selection of Mr. Bellinger's successor.

* * *

O. C. Rollman has resigned as chief construction engineer of the Wisconsin state highway commission to become chief engineer of the Drott Tractor Co., Milwaukee. Mr. Rollman will have charge of sales and all engineering activities of the company, which maintains branch sales and service houses in Madison and Eau Claire, Wis.

* * *

F. A. Buchda, secretary and treasurer of the Eaton Axle & Spring Co., Cleveland, has been made vice president, continuing the duties of secretary. H. C. Steussey, formerly assistant secretary and assistant treasurer, has been made treasurer. Logan Monroe has been named assistant treasurer and F. E. Patterson is the new assistant secretary.

* * *

Arthur F. Scherer, district sales manager of the Cincinnati office of the Wheeling Steel Corp., Wheeling,

W. Va., has resigned after an association of 16 years with the company.

Hubert B. Miller, for the past year connected with the Detroit office of the Wheeling corporation, has been named Mr. Scherer's successor at Cincinnati. Mr. Miller began in the steel industry with Otis Steel Co., in 1907, and went with the Wheeling corporation in 1927.

* * *

New Railroad Link Is Under Advisement

Washington, Oct. 2.—Final argument has been held before division four of the interstate commerce commission in connection with the requests of the Pittsburgh, Lisbon & Western railroad for permission to build an extension to its line and also in connection with the purchase of the road by the Montour railroad.

Attorneys appearing at the argument included A. G. Gutheim, on behalf of the Lisbon road; Don Rose, representing the Pittsburgh Coal Co.; Albert Ward, representing the Pennsylvania railroad; Clyde Brown, the New York Central; and Daniel Willard Jr., the Baltimore & Ohio railroad.

Don Rose, counsel for the Pittsburgh Coal Co., spoke of the advantages the construction of the extension would bring, especially to the coal companies in the Pittsburgh district.

"It lets both the steel mills and the coal companies take advantage of the economies which can be expected by river-rail transportation," he said.

He declared it is foolish from a business standpoint to think that any of the present carriers serving Youngstown would spend money to provide rail-water terminals. Mr. Rose contended that if the application of the Pittsburgh, Lisbon & Western is not finally approved, Youngstown will never get the advantages of lower freight rates.

Mr. Gutheim, on behalf of the Lisbon road, took issue with attorneys for the opposing railroads at their implications that the new road would discriminate against the other coal concerns.

"I was surprised when I read in the briefs this contention, and it comes with poor grace," said Mr. Gutheim.

He attacked the charges made by opponent railroads that the construction of the new line would divert too much tonnage from their lines. Such diversion, he said, would be inconsequential.

Albert Ward, for the Pennsylvania railroad, attacked the relationship between the Montour railroad and the Pittsburgh Coal Co. Ward said that the new line will not develop any new tonnage.

"There is no evidence of any increased tonnage," said Mr. Ward, following a statement by Mr. Rose that idle mines would be put into operation if the new construction were permitted.

All of the counsel for the opposing railroads assailed the application on the ground that it would divert tonnage from existing carriers which they claim are giving Youngstown adequate service. The case has been taken under advisement by the commission.

Hoist Orders Decline

Hoist orders in August showed a falling off in valuation of 11.8605 per cent, according to figures just issued by the Electric Hoist Manufacturers association, 165 Broadway, New York. There was an increase, however, of 2.03 per cent in the number of hoists placed, and an increase in shipments of 8.931 per cent.

Sell Fewer Stokers

Washington, Oct. 2.—August stoker sales declined somewhat from the July total, figures of the department of commerce show. Monthly comparisons follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1926 total	1,361	289	1,072
1927			
August	160	60	100
Total (8 mos.)	1,025	339	686
September	104	48	56
October	95	37	58
November	67	26	41
December	83	29	54
Total (year)	1,374	479	895
1928			
January	75	20	55
February	85	26	59
March	123	31	92
April	88	21	67
May	130	43	87
June	166	82	84
July	193	73	120
August	162	57	105
Total (8 mos.)	1,022	353	669

Obituaries

LEONARD S. TYLER, 48, formerly vice president of the Acme Wire Co., New Haven, Conn., died at his home in that city Sept. 25. He was born in New Haven and upon his graduation from Phillips academy, Andover, Mass., went to Yale university where he was graduated in 1905. Mr. Tyler entered the employ of the Southern New England Telephone Co., of which his father was president, and then spent a year in railroad construction work at Sonora, Mexico. He then became assistant treasurer of the Acme Wire Co. and later its vice president and production manager.

* * *

George M. Haskell, 61, New England representative of the J. G. Brill Co., Philadelphia car manufacturer, died suddenly at the Engineers club, 52 East Fortieth street, New York, Sept. 22.

* * *

Theodore Charles Roberts, 52, consulting engineer, New York, died at his home in that city, Sept. 28. He was born in New Orleans, and at one time was associated with the Guggenheims in Colorado, later was chief engineer for H. M. Byllesby Co. in that state and was associated with the interests of the late Senator W. A. Clark in Arizona. During the World war he manufactured dyestuffs and chemicals. He had been a consulting engineer since 1923, devoting considerable time to writing scientific and engineering articles.

* * *

J. C. F. Yarnell of Detroit, for the past 17 years western sales manager for the Clark Bros. Bolt Co., Milldale, Conn., died Sept. 25 in Kalamazoo, Mich. Prior to his connection with the bolt industry, Mr. Yarnell was engaged in the wagon and carriage spring business.

* * *

Thomas R. Timothy, 52, works manager of the Chester, W. Va., plant of the American Sheet & Tin Plate Co., died Sept. 27 at Pittsburgh. He was born in Leechburg, Pa., and had held executive positions in Wheeling, W. Va. and Bellaire and Martins Ferry, O., before going to Chester 16 years ago.

* * *

Frederick I. Teal, 36, with Eaton, Rhodes & Co. at Cincinnati for a few months, and well known to central and eastern iron buyers, died in that city, Sept. 29. Mr. Teal began his career in iron with Rogers, Brown & Co. in Buffalo, going to the Cincinnati offices of the company in 1920 and in 1925 taking charge of the offices there of the M. A. Hanna Co. A few months ago he joined the forces of Eaton, Rhodes & Co.

Exports Highest Since 1921

Foreign Shipments, Totaling 287,297 Tons, Heaviest in Nine Years, Aided by Large Totals of Scrap and Steel Rails—Imports Rise Also, Although Cumulative Total Loses Somewhat—Shapes Receipts Good

EXPORTS of iron and steel products from the United States in August, marked by substantial increases in scrap and steel rails, gained over the July total, according to the iron and steel division of the department of commerce. The August figure was 287,297 tons, compared with 253,336 tons in July, or a gain of 33,961 tons. Imports in August, likewise gained, strengthened by increases in pig iron and structural shapes. August imports were 69,914 tons, compared with 47,830 tons in July, a gain of 22,084 tons.

IMPORTS AND EXPORTS

Gross Tons

	—1928—		—1927—	
	Imports	Exports	Imports	Exports
Jan.	58,635	205,766	63,404	215,235
Feb.	47,628	185,915	49,451	166,128
March	74,128	221,935	61,872	171,094
April	71,579	215,184	60,374	192,339
May	72,106	267,890	79,814	202,708
June	65,819	262,052	69,017	184,364
July	47,830	253,336	61,112	190,502
Aug.	69,914	287,297	68,386	175,636
Sept.	.....	.....	58,464	166,362
Oct	.....	.....	52,503	170,255
Nov.	.....	.....	61,882	177,928
Dec.	.....	.....	64,188	168,428
Total	507,639	1,899,375	750,467	2,180,969

For the eight-month period, January through August, exports totaled 1,899,375 tons in 1928, compared with 1,499,711 tons in the corresponding period of 1927, increasing 399,664 tons in the current year. Imports on the other hand were 5303 tons shy of the 1927 cumulative total, the tonnage for 1928 being 507,639 tons against 512,942 tons last year.

Not since February, 1921, when a total of 393,328 tons was reached have exports been as high as in this August. Accompanying the record month's total, the daily export movement for August was likewise high, averaging 9268 tons a day compared with 8172 tons per day in July, and with the average of 7784 tons for the eight-month period of 1928. Imports in gaining over July, also maintained a daily movement that was larger than in that month. The average for imports was 2255 tons per day against 1543 tons in July.

Scrap exports noted earlier as having gained considerably, totaled 70,538 tons in August, in contrast with 43,783 tons in July, or an increase of 26,755 tons. Steel rails exports in August gained 12,920 tons, going to 23,999 tons that month from 11,079 tons in July. A gain of 6952 tons was noted in boiler tube and welded pipe exports also.

Principal classes making gains in imports in August include structural shapes, increasing 7892 tons and pig iron increasing 6935 tons. Of the six classes that decreased only two, cast iron pipe and rails, were of any consequence.

Canada remained the principal foreign market for exports from the United States, although receiving 5000 tons less in August than in July. Japanese purchases of products during August were large, scrap making up more than half of the total.

ORIGIN OF PIG IRON IMPORTS

Gross Tons

From:	Aug.	July
Netherlands	1,833	2,325
Norway	321	.....
Sweden	759	355
United Kingdom	2,550	50
Mexico	32	31
British India	7,495	2,994
Germany	.....	300
Totals	12,990	6,055

ORIGIN OF IRON ORE IMPORTS

Gross Tons

From:	Aug.	July
Germany	550	.....
Spain	544	4,300
Canada	870	1,596
Cuba	33,500	11,000
Chile	130,800	102,000
Algeria and Tunis	52,474	40,760
Egypt	6,800	.....
Newfoundland	.....	17,300
Brazil	.....	6,300
Totals	225,538	183,526

ORIGIN OF MANGANESE IMPORTS

Gross Tons

From:	Aug.	July
Germany	6	.....
Soviet Russia in Europe	14,729	15,592
Canada	67	156
Brazil	3,132	3,512
Chile	2,430	.....
British India	2,260	1,799
British West Africa	2,358	.....
Java and Madura	.....	292
United Kingdom	.....	97
Totals	25,996	21,447

ORIGIN OF FERROMANGANESE IMPORTS

(Concentrates)

Gross Tons

From:	Aug.	July
Italy	24	116
France	47	.....
Norway	1,188	279
United Kingdom	919	757
Canada	543	1,739
Totals	2,721	2,891

ORIGIN OF IMPORTS

Gross Tons

From:	Steel bars	Cast iron pipe	Steel scrap	Ingots, blooms, etc.
Austria	51	.....	.....	25
Belgium	2,637	1,523	.....	768
France	2,641	4,763	.....	382
Germany	1,752	1	64	53
Netherlands	21	.....	.....	.....
Sweden	1,104	.....	10	91
United Kingdom	39	.....	27	1
Canada	1	1	5,273	3
Czechoslovakia	22	.....	.....	.....
Italy	.....	.....	20	.....
Norway	.....	.....	.....	5
Totals	8,270	6,288	5,394	1,338

IMPORTS BY COUNTRIES OF ORIGIN

Gross Tons

	August 1928	January through August 1928	January through August 1927
Austria	94	280	538
Belgium	17,367	135,172	145,959
Czechoslovakia	25	980	719
France	14,138	91,455	88,798
Germany	10,267	77,860	93,302
Italy	44	436	228
Netherlands	2,291	20,400	20,667
Norway	1,514	6,249	7,033
Poland and Danzig	538	3,731	2,165
Sweden	2,914	18,693	15,427
Switzerland	17	43	25
United Kingdom	5,357	64,467	40,946
Canada	7,819	47,358	52,378
Mexico	32	419	207
British India	7,495	34,569	30,422
Japan	1	65	21
China	1	4	.....
Denmark	.....	205	108
Hungary	.....	141	.....
Spain	.....	197	30
Cuba	.....	15	2,189
Dominican Republic	.....	806	381
Ecuador	.....	700	.....
Virgin I. of U. S.	.....	3	31
Syria	.....	13	.....
New Zealand	.....	2,001	.....
Morocco	.....	5	.....
Panama	.....	381	19
Jamaica	.....	628	.....
Other Countries	.....	.....	225
Totals	69,914	507,639	512,942

IMPORTS OF IRON AND STEEL

Gross Tons

Item	Aug. 1928	July 1928	January through August 1928	January through August 1927
Pig iron	12,990	6,055	94,340	84,780
Ferromanganese and alloys (1)	2,721	2,891	30,017	19,214
Ferrosilicon (2)	416	332	2,840	6,437
Ferrochrome (3)	94	59	491	382
Scrap	5,394	3,688	31,923	41,863
Iron slabs	....	....	4	....
Steel ingots, blooms, billets, etc	1,338	1,217	14,421	8,578
Steel bars	8,270	4,992	63,574	63,448
Iron bars	67	35	1,452	2,996
Wire rods	1,042	595	11,054	10,087
Hoops, bands and scrolls	2,176	893	13,599	24,062
Boiler and other plate	707	198	4,062	3,224
Sheets, skelp and saw plate	1,566	1,160	17,565	9,488
Tin plate	32	159	783	958
Structural shapes	19,084	11,192	118,962	104,021
Rails and splice bars	911	1,534	12,091	11,847
Cast iron pipe	6,288	7,731	45,536	63,269
Other pipe and tubes	4,456	2,918	28,429	41,772
Barbed wire	384	226	2,359	3,082
Round iron and steel wire	412	408	2,842	2,919
Steel telegraph and telephone wire	15	10	178	31
Flat wire and strip steel	224	132	1,518	1,805
Wire rope and strand	186	168	1,157	1,660
Other wire	53	42	373	304
Nails, tacks and staples	894	1,020	5,757	4,545
Bolts, nuts, rivets and washers	6	11	160	249
Castings and forgings	188	164	2,152	1,921
Total	69,914	47,830	507,639	512,942

(1) Manganese content
(2) Silicon content
(3) Chromium content

Belgium regained its leadership in the American import trade supplanting France which had led in July. The shipments from Belgium included structural shapes in a large quantity, steel bars and cast iron pipe.

EXPORTS OF IRON AND STEEL

Gross Tons

	Aug. 1928	July 1928	January through August 1928	January through August 1927
Pig iron, not including ferro-alloys	8,404	8,598	42,331	31,575
Ferromanganese and spiege.eisen	1,041	1,137	7,039	529
Scrap	70,538	43,783	364,776	145,700
Ingots, blooms, skelp, etc.	16,400	16,020	89,350	59,023
Iron bars	180	471	2,469	3,356
Steel bars	12,517	13,899	97,184	75,971
Alloy steel bars	1,231	1,102	9,825	3,736
Wire rods	3,620	3,638	25,737	10,903
Plates	12,199	14,648	98,573	93,946
Galvanized sheets	13,581	15,341	103,998	111,986
Black steel sheets	19,069	19,150	128,530	118,685
Black iron sheets	1,297	1,355	10,140	11,579
Hoops, bands and strip steel	5,121	4,988	37,806	31,027
Tin plate, terneplate, etc.	22,374	21,528	169,001	188,731
Structural shapes, plain material	14,333	14,509	118,715	93,452
Structural materials, fabricated	6,716	14,156	63,166	45,282
Metal lath	581	574	3,464	3,069
Steel rails	23,999	11,079	144,664	125,179
Rail fastenings, switches, frogs, etc.	2,681	2,487	32,742	23,504
Boiler tubes and welded pipe	30,094	23,142	168,454	182,039
Malleable iron screwed pipe fittings	854	1,072	7,821	6,724
Cast iron screwed pipe fittings	654	710	4,355	4,512
Cast iron pressure pipe and fittings	501	598	7,885	7,740
Cast iron soil pipe and fittings	1,843	1,225	10,653	5,697
Plain wire	3,867	3,265	30,833	21,827
Barbed wire and woven wire fencing	5,494	5,542	49,463	33,846
Wire cloth and screening	235	216	1,297	1,570
Wire rope	509	386	3,473	3,062
Insulated wire and cable	27	84	399	338
Other wire and manufactures of	641	1,060	6,275	6,689
Wire nails	905	1,425	10,937	5,493
Nails, other than wire	680	784	6,328	5,081
Tacks	74	53	528	630
Horseshoes	37	64	306	347
Bolts, nuts, rivets, except track	1,038	1,262	8,800	8,171
Car wheels and axles	1,494	944	10,062	12,026
Iron castings	643	776	7,805	7,860
Steel castings	507	1,097	6,844	5,335
Forgings	1,318	1,168	7,347	3,491
Total	287,297	253,336	1,899,375	1,499,711

DESTINATION OF EXPORTS

(Gross Tons)

Country of destination	August 1928	January through August 1928	January through August 1927
North and Cent. America, West Indies	116,659	888,588	740,668
Canada and Newfoundland	95,638	731,157	564,746
Cuba	6,029	43,553	64,764
Mexico	8,773	55,547	58,689
Guatemala	198	6,297	5,104
Panama	1,323	11,023	13,400
Salvador	209	2,402	3,183
British West Indies	715	5,597	9,626
Other West Indies	2,529	21,962	12,643
Other Cent. America	1,245	11,050	8,513
South America	44,492	302,283	246,530
Argentina	9,247	66,990	55,042
Brazil	8,528	59,463	51,532
Chile	9,408	49,700	28,869
Colombia	3,143	45,740	40,729
Peru	1,223	15,511	25,358
Uruguay	947	6,385	7,700
Venezuela	11,693	54,902	35,517
Other South America	303	3,692	1,783
Europe	43,230	225,265	136,897
Belgium	1,779	10,766	3,239
France	257	3,203	3,893
Greece	9	1,893	2,507
Italy	27,208	79,583	37,867
Netherlands	103	1,535	2,119
Russia	608	2,584	5,643
United Kingdom	3,944	35,408	49,536
Other Europe	9,322	90,293	32,093
Far East	82,289	473,467	362,674
British Malaya	937	4,793	6,552
China	5,457	69,715	38,308
Dutch East Indies	7,628	25,369	26,178
India and Ceylon	3,794	18,120	21,143
Japan and Chosen	51,482	261,643	189,001
Kwangtung	4,469	9,048	15,868
Philippine Islands	5,936	61,064	37,416
Australia	1,747	10,942	19,128
New Zealand	218	1,429	810
Other Asia and Far Eastern markets	521	11,344	8,270
Africa	627	9,672	12,942
British South Africa (Union of)	187	4,001	5,900
Egypt	8	3,414	2,924
Mozambique	123	913	3,304
Other Africa	309	1,344	814

DESTINATION OF AUGUST IRON AND STEEL EXPORTS

Gross Tons

	Rails	Galvanized sheets	Plates not fabricated	Tin, terne plate	Steel sheets black	Barbed wire	Steel bars	Steel scrap
Argentina	.....	548	208	3,099	.....	609	.....	.....
Australia	.....	28	32	.....	485	98	.....	.....
Belgium	36	.....	.....	.....	.....	.....	.....	.....
Brazil	2,071	2,084	.....	1,355	.....	1,338	219	.....
British India	.....	11	.....	.....	.....	.....	.....	.....
British Malaya	.....	.....	.....	52	.....	.....	.....	.....
Brit. S. Africa	.....	8	.....	.....	.....	23	.....	.....
Canada	4,466	2,613	9,988	4,775	8,291	148	8,145	9,458
Cent. America	19	232	121	.....	8	336	333	.....
Chile	6,788	18	6	459	.....	.....	.....	.....
China	2,951	235	.....	596	.....	.....	113	880
Colombia	22	868	4	287	.....	662	.....	.....
Cuba	131	779	357	35	.....	363	338	.....
Dutch E. Ind.	.....	892	.....	.....	.....	.....	.....	.....
Europe	.....	.....	.....	.....	.....	.....	25	.....
Other Europe	.....	144	.....	407	.....	.....	.....	.....
Hong Kong	.....	.....	.....	.....	.....	.....	.....	47
Italy	.....	.....	.....	924	.....	.....	.....	24,536
Japan	3,993	447	.....	4,025	7,719	.....	132	27,006
Java and Madura	.....	.....	.....	429	.....	.....	.....	.....
Kwantung	.....	.....	.....	.....	.....	.....	.....	270
Mexico	1,208	654	62	1,113	299	663	82	863
Norway	.....	10	.....	.....	.....	.....	.....	.....
Peru	71	.....	175	624	3	.....	150	.....
Philippine Isl.	173	.....	.....	382	101	238	148	.....
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	7,834
United Kingdom	.....	.....	.....	.....	26	.....	1,766	121
Uruguay	.....	.....	.....	624	.....	.....	.....	.....
Venezuela	318	.....	.....	10	.....	.....	.....	.....
	23,999	13,581	11,099	22,374	19,069	5,085	12,517	70,538

Plan Large Power Plant For New England

An industrial survey of Vermont is to be undertaken immediately by the New England Power association, according to H. Rocktaschel, a director. The association will soon spend $40,000,000 in developing power from the Connecticut river near St. Johnsbury. It is estimated that 300,000 horsepower is available, and that when completed the project will be second only to Niagara Falls among power developments of the world.

In one hour the American railroads spend $522,166 in operating expenses.

Exports of Metalworking Machinery

(In number except where otherwise specified)

	August 1928	August 1927	January through August 1928	January through August 1927
Engine lathes	86	32	555	386
Turret lathes	37	19	302	183
Other lathes	91	49	547	294
Vertical boring mills and chucking machinery	17	6	78	77
Thread-cutting and automatic screw machines	58	78	567	571
Knee and column type milling machines	50	9	233	145
Other milling machines	60	23	492	258
Gear-cutting machines	48	29	275	268
Vertical drilling machines	44	28	413	180
Radial drilling machines	14	7	100	56
Other drilling machines	81	111	889	1,044
Planers and shapers	52	42	302	274
External cylindrical grinding machines	82	48	651	436
Internal grinding machines	54	36	343	286
Metalworking tool-sharpening machines	59	69	439	519
Other metal-grinding machines, pounds	213,660	115,192	1,223,948	803,550
Sheet and plate metalworking machines, pounds	1,008,456	875,676	6,242,674	3,820,921
Forging machinery, pounds	513,262	550,636	2,499,371	2,811,950
Rolling-mill machinery, pounds	920,254	372,938	6,189,596	5,255,582
Foundry and molding equipment, pounds	1,805,267	358,752	7,567,965	4,001,386
Other power-driven metalworking machinery and parts, pounds	782,733	.....	6,104,436	.....
Pneumatic portable tools	1,808	1,927	13,469	13,045
Other portable and hand or foot operated metalworking machines and parts, pounds	75,680	45,477	680,413	430,021
Chucks for machine tools	2,052	1,473	11,533	11,314

Machinery

Industrial Demand Rising in Importance—September Sales Are at High Rate—Inquiries for Equipment Are More Numerous

REPORTS from all important machine tool and equipment markets indicate that activity is still being maintained at a high rate, although it is doubtful if September sales will equal those of August. Nevertheless, the volume was considerably ahead of that for September, 1927. Inquiries are a little more numerous than they have been for some time recently, and this indicates an active fourth quarter. As the demand for tractors is tapering off, farm implement manufacturers in the Middle West are purchasing less machinery. A notable exception is the International Harvester Co. which is taking items for both its Rock Island and Chicago plants. Industrial demand again is assuming a position of importance. Stocks are being reduced and prices are steady.

New York, Oct. 2.—While scattered, machine tool orders continue fairly numerous, with inquiry steady, the month just closed was as good as August for most sellers, and in some cases, better. A recent buyer of a few machines has been the E. W. Bliss Co., Brooklyn, which has acquired the rights to manufacture in this country an English airplane engine. As they will employ little equipment not already installed, it is believed that the company's purchases for the present are about concluded. Later, as production gets under headway, substantial buying of additional equipment is considered likely. R. E. Hoe & Co., manufacturers of printing equipment and saws, rather recently noted as planning to move to another plant they had purchased in this city are figuring on several machines, including a number of planers. Railroad buying includes a 90-inch axle turning lathe long pending for the New York Central, which is now inquiring for a 16-inch engine lathe.

Chicago, Oct. 2.—Machine tool distributors expect a good month's business, although the total volume undoubtedly will fall below August, which proved to be the heaviest month on record for most dealers, even considering war-time activity. Inquiries are slightly less numerous than last month and are more widely scattered. Thus far, September business generally is ahead of September, 1927. For many weeks, heavy inquiries have come from eight or nine tractor builders tributary to the Chicago district, and with the tapering off of tractor demand, scattered industrial inquiries stand out more prominently. Allis-Chalmers Mfg. Co., Milwaukee, is to buy at once against a large machine tool program for its West Allis, Wis., tractor plant, and it is understood again will buy later for its Springfield, Ill., plant. International Harvester Co. will purchase additional tools for its Farm-all tractor plant at Rock Island, Ill., and also for its tractor works in the Chicago district. A railroad supply manufacturer is expected to issue a good sized inquiry list shortly. Santa Fe railroad has purchased a 100-ton hydraulic spring bender, and several other tools. The Burlington inquiry for shapers and other equipment has not yet been closed, and Chicago & North Western will purchase a large drill and a shaper. Radial drills have been in good demand. A Rockford, Ill., manufacturer bought three radial drills during the week. The recent heavy demand for used tools has reduced stocks greatly, most dealers report. Prices are reported steady.

Pittsburgh, Oct. 2.—Machine tool demand in this district is spotty, buying of heavy equipment being light, while the call for light tools is in fair seasonal volume. One interest reports that September will be the best month so far this year, although most sellers report little improvement in demand since the first of September. Inquiry, however, is fairly active and a good volume of work is pending. Westinghouse Electric & Mfg. Co. has issued its list of tools for the fourth quarter. Crane buying is rather light although a fair number of jobs are pending.

Cleveland, Oct. 2.—No let-up is in sight for activity in this district, for inquiries are good and sales remain at a high level. For some dealers September was the best month for this year, but for all it ranked high. The automotive industry here and in Detroit is buying steadily and is accounted for largely by the introduction of new models. Machine tool builders are working overtime in some cases, to keep up with shipments. Small machinery housed are impressed with the volume of spot buying. In all cases, extremely prompt delivery is demanded. Used machinery is moving well.

Crane exports for seven months of 1928 were $1,928,000, compared with $832,000 in the same period of 1927, a gain of 132 per cent.

CRANE ORDERS PLACED

Four cranes for Steel Co. of Canada, Hamilton, Ont.; awarded as follows: 200-ton, 4-girder ladle crane, 100-ton, 2-girder ladle crane and 5-ton charging crane to Morgan Engineering Co.; and 5-ton electric overhead crane to Shaw Crane-Putnam Machine Co.

Among single orders were: 5-ton electric crane for Western Electric Co., Kearny, N. J., to Cleveland Electric Crane & Engineering Co.; crawler crane for Colonial Sand & Gravel Co., New York, to McMyler-Interstate Co.; 25-ton trolley for Hay Foundry & Iron Works, Newark, N. J., to Morgan Engineering Co.; 1-ton electric crane for American Smelting & Refining Co., New York, for operation in Mexico, to Shaw Crane-Putnam Machine Co.; 15-ton electric crane for Anaconda Copper Mining Co., New York, for operation in Utah, to Shaw Crane-Putnam Machine Co.

CRANE ORDERS PENDING

25-ton, 8-wheel locomotive crane for New York Central; bids asked.

Used truck crane for D. C. Serber Inc., 165 Vermilyea avenue, New York, contractor; bids asked, with liklihood of inquiry being issued shortly for a crawler crane.

Steel Barrels Are Up

Washington, Oct. 2.—Production of steel barrels in August gained comfortably over the July total, statistics of the department of commerce show. Members of the Steel Barrel Manufacturers association, Cleveland, report shipments of 380,343 with unfilled orders of 358,581. Production of I. C. C. barrels was 27 per cent, light barrels 63 per cent and all barrels 56 per cent. Monthly comparisons follow:

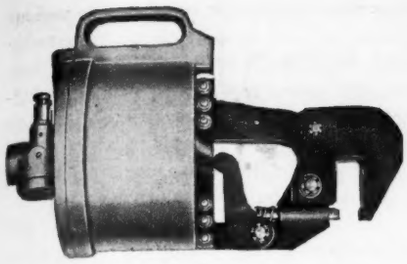
1927	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
Aug.	615,152	610,454	244,518	862,086
Total (8 mos.)	4,585,126	4,574,503	.....	.....
Sept.	521,899	525,374	235,181	889,256
Oct.	578,408	572,893	211,665	788,894
Nov.	500,909	497,345	182,065	633,724
Dec.	444,227	454,638	221,897	1,086,468
1928				
Jan.	475,906	474,159	241,145	1,110,652
Feb.	518,944	514,362	297,889	1,119,738
Mar.	636,855	644,521	304,043	1,039,540
Apr.	667,827	661,949	357,131	919,863
May	696,281	694,843	324,549	932,568
June	712,779	717,496	319,443	840,313
July	647,844	645,881	341,346	891,066
Aug.	677,313	675,600	319,495	744,863
Total (8 mos.)	5,033,749	5,028,811	.....	.....

Special Fixtures Built by Welding Method

(*Concluded from Page* 876)

ful in representing the performance of their units. Others entering the discussion said that the tool builder usually was given insufficient information as to the job when inquiring for machinery.

The session was concluded with a few remarks from F. A. Geier, president, Cincinnati Milling Machine Co., who had just returned from an extensive tour in Europe. The American engineer, he said, has unlimited opportunities as compared with the European engineer. Regarding equipment, Europe's demand is for general purpose machines, America needs the special-purpose types.



No. 251—Pneumatic rivet squeezer

Center Lathe Saves Time in Production Work

(*Continued from Page* 843)

and direct-connected through a flexible coupling.

Designs Segment Wheels for Grinders

No. 250

Blanchard Machine Co., 64 State street, Cambridge, Mass., recently has placed on the market a new segment wheel for surface grinders made by this manufacturer. The wheel consists of a chuck with six abrasive segments fastened in position by three clamping devices. The chuck body is machined from a solid steel forging and is said to be rustproof. The three fixed abutments in the chuck and the three clamping units are made of aluminum bronze. The abrasive segments are made with rounded ends that match with the radius in the fixed abutments and shoes of the clamping devices. The segments are self-aligning, their outer surfaces being molded to the same radius as the bore in the chuck body. When the clamping screw is tightened the segments are forced outward against the machined surface of the chuck body and against the fixed abutments. The abrasive segments are 6 inches in depth when new and it is said that over 5 inches can be used since, as fast as they wear down, they can be loosened and set out.

Machine Squeezes Light Rivets into Place

No. 251

Chicago Pneumatic Tool Co., 6 East Forty-fourth street, New York, is manufacturing a portable pneumatic riveter that squeezes instead of hammers light rivets into place. The riveter is made in two sizes; the smaller one, shown in the accompanying illustration, weighs 8 pounds and is capable of driving steel rivets up to ⅛-inch in diameter, duralumin rivets up to 5/32-inch in diameter and aluminum rivets up to 3/16-inch in diameter. The larger model weighs 16½ pounds and will drive rivets proportionately larger. The yoke is removable and the manufacturer furnishes a wide range of interchangeable yokes for various gaps and reaches. This interchangeable yoke feature is said to permit the use of the machine for a great variety of work. One of the primary purposes for the design of the rivet squeezer was for assembly work incidental to the manufacture of airplanes.

High-Speed Drills Are Light in Weight

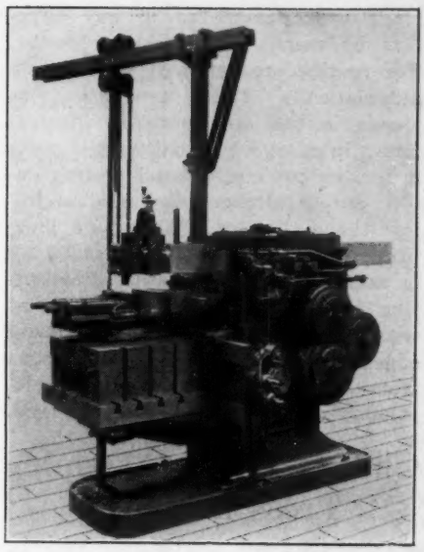
No. 252

United States Electrical Tool Co., 2495 West Sixth street, Cincinnati, recently has designed two new light weight, high speed, ¼-inch, portable electric drills. One of these is the direct-drive type, operating on the armature shaft at a speed of 10,000 revolutions per minute, and weighs 4 pounds. The other operates through a gear reduction at a speed of 2000 revolutions per minute and weighs approximately the same as the first. A new feature of the drills is their keyless chucks. Each drill embodies a universal motor that operates on direct or alternating current of 60 cycles or less, chrome nickel steel gears, one-piece frame and commutator head, and trigger switch.

Announces High Duty Draw-Cut Shaper

No. 253

Morton Mfg. Co., East Broadway and Hoyt street, Muskegon Heights, Mich., recently has designed a new 32-inch stroke, heavy duty, draw-cut shaper. The lower table and outer support is of new design. It is of the angle bracket type and, as shown in the accompanying illustration, is located considerably lower on the saddle, giving 31½ inches clearance between the ram and lower table. This is said to make possible the placing of



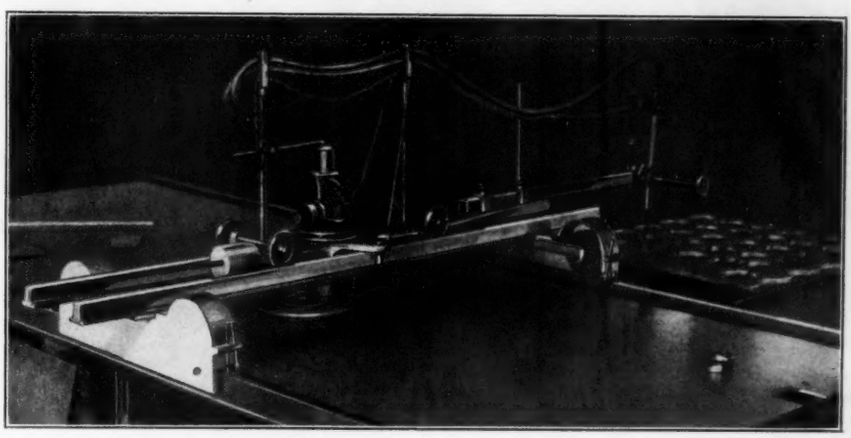
No. 253—Draw-cut shaper

large and bulky castings on the machine to be finished. The ram measures 6 x 6½ inches and is made from a high carbon steel forging. The ram has a bearing surface on all four sides through the entire length of the column and is threaded on one end to receive the cutting head. Automatic relieving type friction feed and power rapid traverse are standard features of the machine. The shaper is equipped with a ½-ton independent crane hoist and can be furnished with either belt or motor drive. The unit has a 32-inch cutting stroke, 32-inch horizontal feed on the table and 16-inch vertical feed of the table.

Automatic Oxyacetylene Shape Cutter Built

No. 254

Linde Air Products Co., 30 East Forty-second street, New York, has placed on the market an automatic oxyacetylene shape-cutting machine designed to cut shapes of any sort from steel plate, sheet, forgings, billets or ingots. In this machine the cutting blowpipe is mounted on a car-



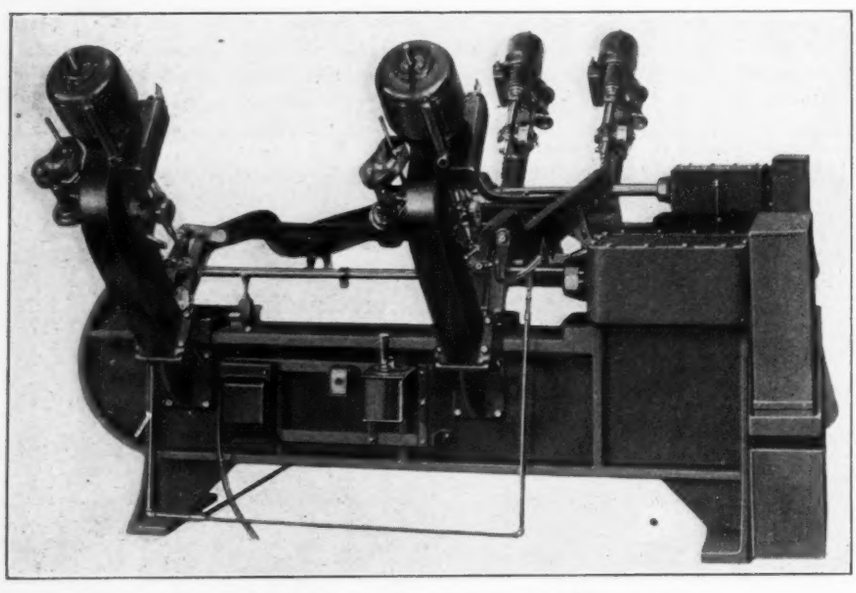
No. 254—Oxyacetylene shape-cutting machine

riage which is moved in any direction by means of an electric motor. For routine production it will operate automatically from templates, as shown in the accompanying illustration. In cases where only a few parts are to be cut out, a hand tracing device can be attached and used to follow the outline of a sketch or blueprint. It is said that little machining is necessary in most cases after cutting because the parts are produced with straight corners and smooth edges. The cutting speed ranges from 3 to 20 inches per minute, depending on the thickness of the metal.

Chassis Frame Assembly Press Designed

No. 255

Hanna Engineering Works, 1765 Elston avenue, Chicago, is placing on the market a chassis frame assembly press designed for use as an adjunct to a chassis frame riveting installation when one or more tubular cross members must be pressed into the horns or outriggers which have previously been riveted to the side bar channel webs. The press rams open wide to permit the quick loading of frame parts. The rams act in unison, advancing until they engage the side bar channel when the speed of advance is reduced automatically, and stopping automatically when the side bar channels are spaced properly. Standard drill heads equipped with automatic feed engagement and reverse to quick return, drill the holes for the rivets which dowel the tubular cross members in place. As shown in the accompanying illustration, the unit is self contained and equipped with motor drive including limit switch controls, drilling compound pump and sump, and pressure pump lubrication of the mechanism.



No. 255—New chassis frame assembly press

Machine Tool Joints Are Lacking Rigidity

(*Concluded from Page* 842)

quirement. Some manufacturers have made substantial progress in eliminating three of these joints by making the adjoining members integral; but much progress can still be made toward getting rid of all inherent defects in the machine.

Chatter is the most serious drawback in obtaining proper results from machine tools. Chatter is usually the result of the tool entering and leaving the stock because of irregularity in the stock or yielding of the machine members or a combination of both. Tool deterioration along the edge is exceedingly rapid under such conditions; and the resultant frequent grinding and resetting of the tools obviously causes a material shrinkage in production. Any such detriment, therefore, inherent in the machine tool construction, can be and should be overcome by machine tool builders. With this defect eliminated from machine tools, the users can readily look to the design of their own product parts and to the condition of the materials used therein for the elimination of further difficulties with machining operations, and can thereby enhance the value of the machine tools to themselves.

In discussing the various papers presented at the symposium, one speaker stated that his company recently had purchased a considerable number of high-grade machine tools to be used in the manufacture of hydraulic shock absorbers for automobiles. When placed in service, 50 per cent of these machines failed to give the accuracy required and which the manufacturers had claimed for them. It was necessary in this case for the buyer to tear down various parts of the tools and to reassemble and realign them to provide the necessary accuracy. The speaker suggested that users were likely to lose confidence in manufacturers when equipment failed to measure up to claims of the salesman.

Every rule has its exception and undoubtedly the examples just given are exceptions. Representatives for the automotive, electrical and railroad industries appeared well satisfied with the manner in which tool builders have appreciated their problems and have developed and provided equipment to suit their special needs.

Record List of Exhibits Seen at Power Show

The power show at New York which is to be held this year Dec. 3-8 is expected to exceed all previous similar shows, judging by the advance list of exhibitors. Already 300 power exhibits have been scheduled, 104 heating and ventilating exhibits, 64 machine tool exhibits and 90 exhibits of transmission equipment. The show will be known as the seventh National Exposition of Power Mechanical Engineering, and will be held in Grand Central Palace. It is held each year during the week of the annual meeting of the American Society of Mechanical Engineers.

New York Group To Meet

An address entitled "Heat, Rust and Acid-Resisting Steels" will be presented by Dr. W. H. Hatfield, internationally famous metallurgist of Sheffield, England, at the opening fall meeting of the New York chapter of the American Society for Steel Treating in the Woolworth building, New York City, Nov. 12. It is expected that Dr. Giolitti, cementation authority of Italy, will speak at one of the later meetings. The suggestion has been made that the New York chapter seek to encourage students in metallurgy in New York colleges by offering cash prizes for unusually good work. Consideration also is being given to a plan by which members of the New York chapter can use the employment bureau of the United Engineering societies.

Will Meet at New York

American Refractories institute, 2202 Oliver building, Pittsburgh, will hold its fall meeting in the Vanderbilt hotel, New York, Oct. 24, instead of at Pittsburgh.

Details for Metal Week Near Completion

National Metal Week, Oct. 8-12, will be featured by technical sessions held by the various societies at headquarters hotels in Philadelphia in the forenoons and at Commercial Museum in the afternoons. The headquarters of the American Society for Steel Treating and of the institute of metals division of the American Institute of Mining and Matallurgical Engineers will be maintained at the Benjamin Franklin hotel, with the American Welding society holding sway at the Bellevue-Stratford hotel. The Drop Forge Supply association is scheduled to hold its annual dinner Wednesday, Oct. 10, at Bookbinders. The metal exposition will be open daily at noon at Commercial Museum. Committee meetings of the various trade societies will be held in Philadelphia during the same week.

Banquets will be the order in the evenings. The annual dinner of the institute of metals division of the American Institute of Mining and Metallurgical Engineers will be held Wednesday evening at the Benjamin Franklin hotel. On the following evening the American Society for Steel Treating will hold its annual banquet in the ballroom of the same hotel while the American Welding society is holding a banquet at the Bellevue-Stratford hotel.

Establishes Trust Fund for Society Awards

At the fifty-fourth convention of the American Electrochemical society, Charleston, W. Va., Sept. 20-21, Dr. Edward Goodrich Acheson, well-known for his work with carborundum and artificial graphite, presented to the society a trust fund of $25,000. This amount is to form the basis of an award every second year of a gold medal and a prize of $1000 to any man who has made a distinguished contribution to any of the branches fostered by the American Electrochemical society. At the same meeting the society presented the degree of "honorary membership" to Thomas A. Edison who has been a member of the society since its inception. Mr. Edison is the fourth honorary member on the society's roster.

Foundrymen Assemble

Upon special invitation of the Detroit Foundrymen's association, Walter Seelbach, president, Arthur J. Tuscany, secretary, and Fred H. Doolittle, central states representative of the Gray Iron institute, attended a meeting of the Detroit Foundrymen's association held in the Fort Shelby hotel, Detroit, Thursday evening, Sept. 20. They spoke on various phases of the work of the Gray Iron institute. Members of the association expressed interest in the work of the institute and offered their assistance in furthering its aims.

Steel Treaters See Film

The Chicago chapter of the American Society for Steel Treating, at a meeting Thursday evening, Sept. 13, heard a paper by R. E. Talley, president, George J. Hagan Co., Pittsburgh, on "Furnaces." The paper dealt with the newer developments in heating, furnace design, and in general emphasized mechanical performance and actual operating data. A motion picture, "The Story of Ingot Iron," produced by the United States bureau of mines in co-operation with the American Rolling Mill Co., Middletown, O., was shown.

The supervisory and executive staff of the Interstate Iron & Steel Co., Chicago, has been covered by a group life insurance policy on a co-operative basis.

Convention Calendar

Oct. 1-5—National Safety council. Seventeenth annual safety congress in New York. W. H. Cameron, 108 East Ohio street, Chicago, is managing director.

Oct. 8-12—American Society for Steel Treating. Tenth annual convention at Benjamin Franklin hotel and National Metal exposition at Commercial Museum, Philadelphia. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Oct. 8-12—American Welding society. Annual fall meeting at Bellevue-Stratford hotel, Philadelphia. Miss M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Oct. 8-12—American Institute of Mining and Metallurgical Engineers. Meeting of institute of metals division at Benjamin Franklin hotel, Philadelphia. W. M. Corse, 810 Eighteenth street, Washington, is secretary.

Oct. 10-12—National Association of Farm Equipment Manufacturers. Annual convention at Minneapolis. H. J. Sameit, 608 South Dearborn street, Chicago, is secretary.

Oct. 11-13—American Gear Manufacturers association. Semiannual meeting at Hotel Statler, Buffalo. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

Oct. 15-18—National Hardware Association of the United States. Thirty-fourth annual convention at Marlborough-Blenheim, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 17-19—Society of Industrial Engineers. Fifteenth natinoal convention at Hotel Seneca, Rochester, N. Y. George C. Dent, 205 West Wacker drive, Chicago, is secretary.

Oct. 24—American Refractories institute. Fall meeting at Vanderbilt hotel, New York, Dorothy A. Texter, 2202 Oliver building, Pittsburgh, is secretary.

Oct. 26—American Iron and Steel institute. Fall meeting at Hotel Commodore, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

Scholarship Offered for "Yankee Ingenuity"

A scholarship to the member of the freshman class showing the most "Yankee Ingenuity" is offered by Henry J. Fuller, '95, at the Worcester Polytechnic institute, Worcester, Mass. This is addition to five new scholarships and the augmented industrial scholarships offered by central Massachusetts steel and metal industrial concerns.

Industrial scholarships are awarded sons or relatives of employes by the following: American Steel & Wire Co., four; Crompton & Knowles Loom Works, four; Graton & Knight Mfg. Co., one; Heald Machine Co., two; Leland-Gifford Co., one; Morgan Construction Co., one; New England Power Co., one; Norton Co., six; Reed & Prince Mfg. Co., four; Riley Stoker Corp., one; Rockwood Sprinkler Co., one; Strathemore Paper Co., one; Westinghouse Electric & Mfg. Co., one, and Wyman-Gordon Co., one. These scholarships are offered annually and application is made to the company for renewal.

Praises Associations in Foundry Talk

At the first fall meeting of the recently-organized Associated Brass Founders of New England, held Sept. 26 at the Engineers' club, Boston, Pat Dwyer, engineering editor, *The Foundry*, Cleveland, leading up from a historical reference to the foundry industry to a review of present day conditions, stated that the formation of business associations is a long and important step in the right direction.

Officers of the association are: President, J. A. Duncan, N. M. Duncan & Sons Co., East Boston; vice president, Geo. W. Thornburg, Crescent Park Brass Foundry, Waltham, Mass.; second vice president, C. A. Perkins, C. A. Perkins Co., Roslindale, Mass.; secretary, L. P. Robinson, 141 Milk street, Boston; treasurer, Oscar Swangren, Dorchester Brass & Aluminum Foundry, Hyde Park, Mass.; statistician, H. E. Bryant, West Bridgewater, Mass.

The next meeting of the administrative board of the American Engineering council will be held in Pittsburgh Oct. 19-20, under the auspices of the Engineers Society of Western Pennsylvania. Arthur W. Berresford, president, will be in charge.

Describes Spain's Iron and Steel Industry

(*Concluded from Page* 832)

cent. This estimate now is considered conservative. The most valuable ore in the district is the red hematite. The iron content ranges from 32 to 42 per cent for the lowest-grade ore, to 50 to 52 per cent for the richest. The poorest grades contain 35 to 40 per cent silica. The rich ores, however, are difficult to reduce. The lower grade ores are easier to reduce, especially after preliminary roasting.

Table I shows the production of iron ore in Spain during recent years. Table IV gives export figures by countries of destination. Maximum production was reached in 1913 with 9,861,668 metric tons. The war caused a considerable drop in exports, owing to difficulties of maritime transportation, and increased domestic consumption. Production in Spain decreased concurrently with the reduced foreign demand, until in 1922 the output was only 28 per cent of that of 1913. Since then production has gradually increased and in 1927 the output was the highest registered since 1917, but still only 50 per cent of the production of the year immediately preceding the war.

Export business has not resumed its prewar prosperity, and only slender hopes are held that it will do so in the future. However, a considerable increase was registered in 1927. The ore produced in Santander and Vizcaya is used in part by the Vizcaya ironworks, the balance, which constitutes the major portion, being exported through the ports of Santander and Bilbao. The Teruel output is used at the blast furnaces of Compania Siderugica del Mediterraneo. The Almeria output is exported.

Table VI shows the production for 1927 and 1926 of those provinces whose output exceeded 100,000 tons. The table also gives, for 1926, the gross value of the output at the mines, the value per ton, and the iron contents. The richest ore, containing 60 per cent iron, was obtained from Zaragoza, which yielded 38,628 tons. The poorest ore, containing 44 per cent iron, came from Guadalajara, which gave 30,368 tons.

The output of Vizcaya in 1926 amounted to about 45 per cent of the total for the country; in 1927 it was about 41.5 per cent. During 1926, 74 mines were in operation. Extraction was restricted, owing to the reduced demand from Great Britain, then in the throes of the general strike. In 1927 activities greatly expanded. Vizcaya ore goes to Great Britain, Germany, France and Belgium. Exports to Germany have not regained their prewar level; exports to Holland are mainly for German destination. In December, 1926, best rubio ore was sold at 20 to 24 pesetas per ton f.o.b. Bilbao; best quality carbonate was sold at 18 to 23 pesetas. The price of best rubio in August 1928 was 22s 6d ($5.45) c.i.f. Middlesbrough. Of the 1926 output of the Vizcaya mines, 893,190 tons was exported through Bilbao and Castro-Urdales, 50,000 tons were smelted in the blast furnaces of the province, and 72,000 tons were shipped to the Asturias. About one-third of the output is in the form of carbonates; two-thirds is rubio. During the year 1926, 5011 workmen were employed in the iron ore mines, as against 6126 in 1925.

In the province of Almeria, 29 mines were operated in 1926. The greater part of the output comes from the zone of Sierra Filabres, where are located the Seron and Bacares groups. The Seron group is exploited by Compania Cabarga San Miguel and comprises the Menas mines, where as much as eight tons per day per hectare (2.47 acres) was extracted. The ore is mainly oxide containing 47 per cent iron. The Bacares group is mined by the Bacares Iron Ore Mines, Ltd., of London. There the annual output per hectare in 1926 was 250 tons, and the annual output per man 283 tons. A network of cables 24 kilometers long joins the mines to the railroad at Seron, 109 kilometers from Aguilas. Another company, Compania Minera de Sierra-Alhamilla, operates mines at Lucainena de las Torres. The ore is carbonate of iron and is roasted near to the mines in eight ovens, each capable of roasting 50 tons per day. In 1926, 93,566 tons of Almeria ore was exported through Garrucha, and 22,000 tons was for coasting trade. During the year 2854 workers were employed at the mines of Almeria.

Twenty-two mines in the province of Santander were operated in 1926, employing 2273 workers. The amount extracted in 1927 was 664,990 metric tons, against 385,245 tons in 1926. A large proportion of the ore is rubio. The principal mining companies are: Compania Minera de Dicido, Compania Minera de setares, and Sociedad Minera Cabarga San Miguel. Mining generally is done in the open, still to a great extent in the manner described in IRON TRADE REVIEW, Jan. 20, 1921, although some mechanical improvements have been made. Only two mines were operated in the province of Teruel, employing 360 workmen. The output in 1927 was 836,106 tons, as against 217,303 tons in 1926. The sole mining company is Compania Minera de Sierra Menera. The output goes mainly to the furnaces of Compania Siderugica del Mediterraneo. The relatively small number of men employed is noteworthy and due to the extensive use of mechanical methods. The ore is not exported, because Swedish and North African ore is more favorably situated geographically to be shipped to other countries. All these provinces produced considerably less in 1926 than in 1925, but the 1927 output showed considerable improvement.

(To be Concluded)

Table VI

Where Spain Mines Most of Its Iron Ore

Province	Output (Metric tons) 1927	Output (Metric tons) 1926	Value (Pesetas) 1926	Average Value per ton 1926	Average iron contents per ton 1926
Vizcaya	2,043,783	1,450,740	18,598,486	12.82	48
Almeria	571,765	562,337	4,228,774	7.52	47.61
Santander	664,990	385,245	4,206,875	10.92	48.50
Teruel	836,106	217,303	1,173,436	5.40	46
Other provinces	789,656	565,964	5,489,861	9.70	44 to 60
TOTAL	4,906,300	3,181,589	33,697,432	.....	44 to 60

Reports Greater Output

Toronto, Ont., Oct. 2.—Substantial increases in the production of steel and coal were reported by President McNaught in presenting his report at the annual meeting of the British Empire Steel Corp. at Montreal, Sept. 18. The current year, he stated, is not expected to make so favorable a showing, particularly in coal. This is due to the fact that a year ago the company benefited from the strike in England. The reorganized board of directors, appointed when the Gundy-Holt interests acquired control, was re-elected.

British Exports Large

(*Concluded from Page* 878)

Among the imports the tonnage of scrap was more than twice the amount imported in July, the August total being 11,629 against 5342 tons the previous month. Foreign semifinished steel in the form of blooms, billets, slabs, etc., show increases of about 5000 tons and bars, rods, angles also increased from 43,169 tons in July to 54,005 in August. Iron bars rose from 13,703 to 18,502 tons. Other increases include steel girders, beams, etc., plates, sheets and wire. Import of hollowware has been reduced to small proportions, only 385 tons being bought by this country. In the eight months, however, iron and steel imports generally show a considerable decrease compared with the same period last year.

Exports of coke and manufactured fuel totaled 303,241 tons, compared with 289,357 tons in July and 312,257 in 1927. Coal exports totaled 4,274,391 tons, compared with 4,162,802 in July, and 4,257,381 in August last year.

General exports were valued at £62,216,978, against £60,885,097 in July, and £59,410,332 in August last year. The value of the general imports was £97,700,572, compared with £95,468,408 in July, and £90,116,206 in August last year.

Brazilian Steel Plant Much Improved

Brussels, Sept. 21.—(*European Staff Service*)—The report of the Companhia Siderurgica Belgo-Mineria, which exploits ore mines and operates works in Brazil, and in which the Arbed has a considerable interest, has been issued. The financial result of 1927 is a loss of 404,134 milreis. The report mentions that the situation of the Brazilian iron and steel industry has not improved, and that the financial difficulties mentioned in the previous report prevailed throughout 1927. During the first half of the year the plant was closed down, and during that period opportunity was taken to complete the installation of the works. The works reopened July 18, 1927, and operated normally until the end of the year, with one blast furnace and one rolling mill.

An additional stack of 50 tons has been erected and will be blown in as soon as market conditions are favorable. This brings the number of furnaces in the works to two. At the end of the year a 50-ton open-hearth furnace was completed and started operating Dec. 22; this furnace now is operating under satisfactory conditions. There now also are two open-hearth furnaces in the plant. Conditions are more favorable than a year ago, due more particularly to improvements in equipment. Pig iron sales are increasing, and sales of merchant steel also are more satisfactory. The Brazilian government has granted to the concern a large concession on coal mines.

French Steelmaker Finds Year Unprofitable

Office of IRON TRADE REVIEW,
9 Rue de Londres

PARIS, Sept. 21.—(*European Staff Service*)—The report of the Societe Metallurgique de Knutange for the financial year 1927 states that the situation at the beginning of the year was affected by the appreciation of the franc, which had begun to take place in the previous year, and that the concern had great difficulty in selling its products at a profitable price. The situation improved toward the end of the year, and the formation of comptoirs for semifinished steel and structural steel also has exerted a favorable influence. Commercial relations with Germany have developed satisfactorily.

During the year technical improvements were effected in the company's plant with a view to greater efficiency and economical production. Further improvements will be made. Supplies of coke were sufficient to satisfy requirements of the seven blast furnace stacks which operated during the year, but it is stated that the price of coke delivered at the works, including taxes, is hardly economical. The ore mines yielded sufficient to meet requirements of the furnaces. Although actual figures of production are not yet available, it is said that the output of pig iron was 94 per cent of the 1913 tonnage and 67 per cent of the maximum capacity of production. The output of raw steel was 100 per cent of the 1913 tonnage and 64 per cent of the maximum capacity of production; this would correspond to an output of raw steel of about 500,000 tons. The output of rolled products was 98 per cent of the 1913 tonnage and 62 per cent of the maximum capacity of production. The output of the ore mines increased by 8 per cent over the 1927 tonnage.

Exports of steel were 63.7 per cent of the output, as against 43 per cent in 1926. The principal countries to which the concern has exported its products are: Great Britain, India, Germany, Italy, and the Saar. The financial result of the year was a loss of 9,884,207 francs ($385,000). In the balance sheet this loss is to be added to the losses incurred in previous unfavorable years, and total losses now exceed 44½ million francs ($2,100,000)

French Export Market Offers Better Prices

Office of IRON TRADE REVIEW,
9 Rue de Londres

PARIS, Sept. 21.—(*European Staff Service*)—The tendency toward firmer prices, reported previously, continues, both in the domestic and export markets, but particularly in the latter, where bars have reached £6 2s 6d ($29.65) f.o.b. Antwerp, this price being decidedly higher than prewar quotations.

International meetings have been held in Belgium at the Chateau d'Ardennes. One meeting was between representatives of wire product manufacturers with the object of re-establishing the entente that was broken up in October, 1927. Although no official reports are yet available, it is understood that no agreement could be reached. This is an important question, as the existence of the wire rod entente depends on re-establishment at an early date of the syndicate of wire product manufacturers. In the meantime the wire rod syndicate itself held a meeting Sept. 11, and the price of wire rod for export has been raised 2s 6d (60.00c) per ton. The price now will be £6 2s 6d ($29.65), and will be more proportionate to the price of merchant steel. The directing committee of the European steel entente met in Luxemburg Sept. 14, and production quotas for the fourth quarter remain unchanged.

Franc—3.91c

The output of French collieries during July was substantially less than in preceding months. On the other hand, coke producers have increased their output, owing to the satisfactory occupation of French iron and steel works. The pig iron market is active. Users of semifinished steel still find it difficult to obtain supplies; deliveries are considerably extended, and the export price being slightly more profitable than the domestic, makers are tempted to give more attention to exports. There is a considerable demand for merchant steel, which comes particularly from large warehouses and jobbers, and the price of merchant bars has risen to 750 francs ($29.25) f.o.b. eastern mill. In view of the present tendency of the market, it is expected that at the next meeting of the comptoir of A-products, which fixes the prices of semifinished steel and structural steel, an increase will be decided upon.

The plate and sheet market is firm. Heavy plates range between 780 and 800 francs ($30.45 and $31.20). Medium-sized sheets range from 850 to 870 francs ($33.10 to $33.95), and the basis price of light-gage sheets is about 1150 francs ($44.90). There is considerable activity among automobile manufacturers, and large producing firms such as Renault and Citroen are ordering substantial tonnages of steel, with deliveries scheduled over a number of months. Citroen is bringing out a new 6-cylinder, 14-horsepower car.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BRISTOL, CONN.—The forge plant of the New Departure Mfg. Co., which was completed two or three years ago, is already inadequate and a new addition is planned. This is expected to raise the production of the forge plant from 160,000 bearings a day to 175,000. The New Departure company has awarded the contract for structural shapes for its plant addition to Berlin Construction Co. (Noted Sept. 6.)

GEORGETOWN, CONN.—Gilbert & Bennett Co., manufacturer of wire cloth, has awarded the general contract for a 1-story plant addition to H. Wales Lines, Meriden, Conn.

MIDDLEFIELD, CONN.—Lyman Gun Sight Corp., is contemplating extensions and improvements in its plant.

NEW HAVEN, CONN.—General contract for a 1-story plant addition, 42 x 60 feet, for H. T. McCluskey & Sons Inc., wire cloth manufacturer, has been awarded to Emil W. Lundstrom, Hamden, Conn. (Noted Sept. 3.)

NORWALK, CONN.—Connecticut Light & Power Co., 107 West Main street, has awarded the general contract for a 1-story service building, 122 x 222 feet.

WATERBURY, CONN.—French Mfg. Co., manufacturer of bronze and copper tubing, has awarded the contract for a 1-story plant addition, 60 x 200 feet, to Torrington Building Co., Torrington, Conn.

WEST MYSTIC, CONN.—Sea Sled Corp., J. A. Christen, plant manager, plans the construction of a boat manufacturing plant.

BINGHAM, ME.—Central Maine Power Co. has started work on its new hydroelectric plant above here on the Kennebec river. The Connecticut Power & Light Co. has tentative plans for further power development on the Housatonic river. It is possible that four more hydroelectric plants will be built along the river.

BALTIMORE—Locke Insulator Corp., Charles and Cromwell streets plans the erection of a laboratory.

CUMBERLAND, MD.—Celenese Corp. of America, 15 East Twenty-sixth street, plans the construction of a 1-story turbine house. F. T. Small, 15 East Twenty-sixth street, is engineer.

BOSTON—New England Engineering Corp. has been incorporated with $10,000 capital to manufacture and deal in machinery by Thomas A. Bowers, 100 Queensbury street, Boston.

BOSTON—Packard Motor Car Co. is receiving bids on revised plans for its 4-story sales and service station, 95 x 225 feet, to be built at 1897 Commonwealth avenue, here. Albert Kahn Inc., Marquette building, Detroit, is architect for the project.

BRIDGEWATER, MASS.—Board of education, state house, Boston, is revising plans for the rebuilding of its power plant at the State normal school.

CAMBRIDGE, MASS.—City is receiving bids on its revised plans for a pumping station. E. T. P. Graham, 171 Newbury street, Boston, is engineer for the project.

CAMBRIDGE, MASS.—American Television Corp. has been incorporated with $50,000 capital to manufacture and deal in television apparatus, etc., by C. R. Burke, Lincoln Place, Natick, Mass.

EAST BOSTON, MASS.—Bethlehem Shipbuilding Corp. has awarded the general contract for a 3-story plant addition at 80 Border street. (Noted Sept. 20.)

NATICK, MASS.—American Seal Kap Corp., manufacturer of metal bottle caps, plans to remove its plant to two buildings, 90 x 240 feet, which the company purchased recently.

NEWTON, MASS.—National Packaging Machine Co., 445 Watertown street, has awarded the general contract for a 4-story manufacturing plant addition on Watertown street.

NORTH EASTON, MASS.—Ames Shovel & Tool Co., Main street, has awarded the contract for a 1-story plant, 60 x 400 feet, to be built on Main street.

PROVINCETOWN, MASS.—American Motorless Aviation Co., Box 411, Cornhill, plans the construction of a hangar and an assembly plant here.

WEST SPRINGFIELD, MASS.—E. W. Michalek & Sons Inc. has been incorporated with 100 shares no par value stock to manufacture pipes, fittings and apparatus for heat, light and gas for buildings, manufacturing plants, etc., by Donald J. Michalek, 59 Hanover street, West Springfield.

HILLSIDE, N. J.—Lionel Corp., 24 Neslett street, Newark, N. J., manufacturer of toy trains, etc., plans the construction of a 2-story manufacturing plant. Austin Co., 120 Broadway, is engineer.

JERSEY CITY, N. J.—Garwood Machinery & Equipment Corp. has been incorporated with $25,000 capital by Corporation Trust Co., Jersey City.

JERSEY CITY, N. J.—Mundt & Sons, 53 Fairmount avenue, plans the construction of a 2-story plant for perforated metal manufacture 35 x 132 feet. J. T. Rowland, 30 Journal square, is architect.

JERSEY CITY, N. J.—Cresent Aircraft Corp., Lindenhurst, L. I., will establish an airplane manufacturing plant on property recently purchased here. Chamberlain Aeronautical Corp., organized recently by Clarence Chamberlain, will occupy the plant jointly. (Noted Sept. 20.)

KEARNY, N. J.—Delaware, Lackawanna & Western railroad, 90 West street, plans the construction of a power station on the Hacken-

Resale Equipment News

MACHINERY and equipment of the Walden Knife Co., Walden, N. Y., will be sold at public auction Oct. 5 by Samuel T. Freeman & Co., auctioneers. The sale includes milling machines, drill press, lathe, shapers, grinders, filing machines, hack saws, drop hammers, boring machines, buffers, polishers, oil tempering and heating furnaces, air compressors, tanks, motors and other equipment.

* * *

Machinery, equipment and other property of the O. Armleder Motor Truck Co., Twelfth street and Central parkway, Cincinnati, will be sold at auction in liquidation Oct. 18, by Joseph Harris Co., auctioneer. The sale will include materials, machinery, plant equipment, used trucks and office furniture.

* * *

Machinery and other property in the plant of Sloan & Chace Inc., Newark, N. J., will be sold at auction Oct. 4. Included in the sale is a considerable stock of parts for precision millers, pinion cutters, bench lathes, drills, tapping machines, jigs, tools, milling attachments, slide rests and other tools. The manufacturing equipment of the plant and miscellaneous equipment will be sold also.

Sales Calender

Oct. 5—Auction of equipment of Walden Knife Co., Walden, N. Y.

Oct. 9-11—Warwick Iron & Steel Co. real estate and equipment to be sold at auction in liquidation.

Oct. 11.—Auction of navy surplus and surveyed material at Norfolk, Va., navy yard.

Oct. 18—Auction sale property of O. Armleder Motor Truck Co., Cincinnati.

sack river, here. G. J. Ray, Hoboken, N. J., is chief engineer.

MONTCLAIR, N. J.—Safety Signal Corp. of New Jersey has been incorporated with $50,000 capital to manufacture and deal in signals by P. Henry Strazza, Montclair, attorney.

NEWARK, N. J.—Public Service Electric & Gas Co., 80 Park place, plans the construction of two electric substations.

NEWARK, N. J.—National Air Transport Inc., 5930 South Cicero avenue, Chicago, plans to erect an airplane hangar at the municipal airport.

BINGHAMTON, N. Y.—Metallurgical Equipment & Supply Co. has been incorporated with $50,000 capital to manufacture and deal in machinery, etc., by Taft & Yeomans, Binghamton, attorneys.

BROOKLYN, N. Y.—Steel Tubes Inc., J. L. Sussman, president, plans the construction of a 1-story manufacturing plant at Scott avenue and Montrose. Austin Co., 1220 Jefferson building, Philadelphia, is architect.

GARRISON, N. Y.—New York Central railroad, 466 Lexington avenue, New York, has awarded the general contract for a 1 and 2-story repair shop and signal station here. F. B. Freeman, New York, is chief engineer.

LONG ISLAND CITY, N. Y.—Jerome W. Hurych Mfg. Co., 2431 Kindred street, Astoria, L. I., is inquiring for lathes of different sizes, two or three planers, compressed air forging equipment, shaper, automatic gear cutter, etc.

MALONE, N. Y.—Rutland railroad plans the construction of a new heating plant here. Bids are already in on boiler and chimney work with the bids for other construction work to come in later.

MASSENA, N. Y.—Aluminum Co. of America has started construction work on its mill building, 150 x 1000 feet, here.

NEW YORK—Leeds Scrap Iron & Steel Co. has been incorporated with $20,000 capital by E. I. Herbst, 220 Broadway, attorney.

NEW YORK—Carbonice Co. has been incorporated with 5000 shares no par value stock to manufacture and deal in ice machinery by G. Hoerner, 220 West Forty-second street, attorney.

NEW YORK—Karasik Steel Products has been incorporated with 100 shares no par value stock by L. Karasik, 16 Court street, Brooklyn, attorney.

NEW YORK—American Museum of Natural History, Columbus, avenue, plans the construction of a 5-story power and service station. Trowbridge & Livingston, 527 Fifth avenue, are architects.

HOMESTEAD, PA.—Homestead Valve Mfg. Co., manufacturer of valves, machinery, etc., will move to its new plant on Narrows Run road, near Coraopolis, Pa., which the company purchased recently.

PHILADELPHIA—Railway Track-Work Co., East Thompson and Clementon streets, plans to build a 1-story machine shop, 55 x 100 feet.

PHILADELPHIA—Wilkening Mfg. Co., manufacturer of automobile piston rings, has purchased the plant of the McFarland-Meade Co., Seventy-first street and Kingessing avenue. The plant was used formerly for the manufacture of metal sash and fireproof doors.

PHILADELPHIA—Philadelphia Flying Service Co., Island road and Penrose Ferry southeast, has awarded the general contract for a 1-story airplane hangar to Airport Equipment Division.

PHILADELPHIA—The contract for a 1-story manufacturing and service branch for the White Co., Cleveland, manufacturer of motor buses and trucks, has been awarded to Barclay White & Co., 22 North Thirty-sixth street.

PHILADELPHIA—Heintz Mfg. Co., Front street and Olney avenue, manufacturer of pressed steel automobile bodies, will build a 1-story manufacturing plant addition. Carson & Carson are architects.

PHILADELPHIA—E. F. Houghton Co., 240 West Somerset street, has awarded the general contract for a chemical laboratory to Farrell-Roth Construction Co., 21 South Forty-sixth street.

PITTSBURGH—County commissioners plan the selection of a site for the city-county airport, in the near future. The location tentatively in mind is near Bettis field, McKeesport, Pa.

PITTSBURGH—Duquesne Light Co. plans the erection of a new power plant on Brunot's island in the Ohio river. Actual construction will start this year. Plans provide for future expansion. The equipment will consist at first of one 60,000-kilowatt turbogenerator and three boilers, and eventually the building will be fitted to accommodate two such generators and six boilers.

East Central

BATAVIA, ILL.—Lindgren Foundry Co. plans the construction of a foundry building addition, 30 x 60 feet.

CHICAGO—Structural steel for a warehouse for the Central Steel & Wire Co. has been awarded to Reuter Bros. (Noted Sept. 6.)

CHICAGO—International Steel & Iron Co., 3136 West Fifty-first street, has awarded the general contract for the construction of a 1-story plant, 156 x 320 feet. (Noted Aug. 9.)

CHICAGO—Electric Household Utilities Corp., successor to the Hurley Machine Co., will build an addition to its plant, 80 x 400 feet, at West Twenty-second street and South Fifty-fourth avenue. (Noted Aug. 30.)

CHICAGO—Galvin Mfg. Corp., 847 West Harrison street, has been incorporated with $50,000 capital to manufacture and deal in radio apparatus and appliances, etc., by P. V. Galvin, L. A. Galvin and J. E. Galvin.

CICERO, ILL.—Rome Co., manufacturer of bed springs, suffered damage to its 2-story manufacturing plant in a fire and explosion recently.

CICERO, ILL.—Oldfield Engineering Co., 2632 West Twenty-sixth street, has awarded the contract for the construction of a plant, 150 x 643 feet, for the manufacture of gas plant equipment. (Noted Sept. 20.)

EAST PEORIA, ILL.—Toledo, Peoria & Western railroad has awarded the contract for buildings for mechanical facilities to the Austin Co., Cleveland.

HARVEY, ILL.—Bliss & Laughlin Inc. has awarded the contract for structural steel for its plant to be constructed at Buffalo, to Lackawanna Steel Co. (Noted Aug. 30).

JOLIET, ILL.—Knapp Bros. Mfg. Co., G. A. Knapp, Cicero, manager, has awarded the general contract for a 1-story plant, 120 x 604 feet, for the manufacture of metal trim and building specialties.

MONSENTO, ILL.—Eastern Electrolytic Co. has awarded the structural steel contract for its plant to be built here to American Bridge Co.

ROCKFORD, ILL.—Rockford Malleable Iron Works is making extensive additions to its plant. Last month this company was merged with the Northwestern Malleable Iron Co., Milwaukee, to form the Rockford Northwestern Malleable Corp. Northwestern Malleable Iron Co. is moving its plant and offices to Rockford in the near future. (Noted June 28).

INDIANAPOLIS—Link-Belt Co. has awarded the structural steel contract for building construction to Insley Mfg. Co.

INDIANAPOLIS—Laith Chevrolet Co., Brookville road and East Washington street, soon will award the contract for the construction of a 1-story machine shop and service building, 154 x 170 feet.

RICHMOND, IND.—Automotive Gear Co. has awarded the contract for structural steel for its plant to Massillon Bridge & Structural Co.

BUCHANAN, MICH.—Clark Equipment Co., manufacturer of automobile axles, metal wheels, etc., is having work completed on its 1-story plant addition, 180 x 255 feet at its plant at Battle Creek, Mich. Work is also contemplated at the Berrien Springs branch plant.

DETROIT—Selik Tool & Die Co., 1831 Van Dyke avenue, is inquiring for a milling machine.

DETROIT—Fisher Body Corp., General Motors building, is inquiring for general equipment for its proposed 1 and 3-story automobile body plant on Beaubien street. (Noted Sept. 27.)

DETROIT—Oldberg Mfg. Co., 2661 East Grand boulevard, is inquiring for machine shop equipment for its proposed plant addition. (Noted Sept. 27.)

DETROIT—Manufacturers' Machine Products Co., 1320 Mt. Elliott avenue, manufacturer of special tools and machines, is inquiring for a drill and equipment.

DETROIT—Graham-Paige Motor Corp., 8505 West Warren avenue, has awarded the general contract for a 2-story engineering department building 60 x 300 feet. (Noted Aug. 16.)

DETROIT—Briggs Mfg. Co., manufacturer of auto bodies, is completing arrangements for the purchase of the plant of the William J. Oliver Mfg. Co., Knoxville, Tenn., and plans to establish a branch plant in that city.

DETROIT—McManus Steel & Iron Co., 3290 Wight street, has been incorporated with 150,000 shares of no par value stock to manufacture and deal in steel and iron castings of all kinds, by Patrick J. McManus, Detroit.

DETROIT—Long Mfg. Co., 2768 East Grand boulevard, manufacturer of automobiles, radiators, machinery, etc., has awarded the contract for a 2-story plant addition to Edward Chase, Detroit.

DETROIT—Detroit Gasket Co., 6209 Hamilton avenue, manufacturer of gaskets, is inquiring for machinery for gasket manufacture for its proposed 1-story plant. (Noted Sept. 27.)

DETROIT—Overcashier Aircraft Mfg. Co., 505 Murphy building, has been incorporated with $50,000 capital to manufacture and deal

in airplanes, parts, etc., by Frank A. Overcashier, Detroit.

DETROIT—Joseph N. Smith Co., 5914 Federal street, is inquiring for equipment for the manufacture of automobile hardware and small parts for its proposed 2-story manufacturing plant, 82 x 150 feet, to be built on Federal avenue.

ESCANABA, MICH.—Dewey Furnace Co., 108 South Twelfth street, has been incorporated with $25,000 capital to manufacture and install warm air furnaces by D. D. Dewey.

HIGHLAND PARK, MICH.—Dayton Underground Sprinkler Corp. has been incorporated with $100,000 capital to manufacture and deal in sprinkling, plumbing, electrical equipment, etc., by Herbert S. Jacks, 16834 Hamilton avenue.

JACKSON, MICH.—Watts-Morehouse Co., manufacturer of automobile trunks, and the O. C. Harrington Co., manufacturer of automobile products, have taken over the last idle unit of the Earl Motors Corp. plant No. 9 here. The two companies are now engaged in refitting and remodeling the building to give each an increased 50,000 square feet of floor space.

LANSING, MICH.—Olds Motor Works has purchased property totaling five acres adjoining the present Olds holdings and indicates that the company is considering further expansion. The land is at present occupied by several buildings, to be cleared from the site immediately.

SAGINAW, MICH.—Consumers Power Co., Jackson, Mich., plans the construction of an electric substation here.

ST. JOSEPH, MICH.—John L. Cummings Co., organized recently for the manufacture of various types of foundry refractories and specialties, plans to start soon on a manufacturing plant, 66 x 100 feet, a similar unit to be built later. John L. Cummings is president.

CLEVELAND—Eaton Axle & Spring Co. has taken bids on structural steel for its plant addition. (Noted Sept. 20.)

CLEVELAND—Gears & Forgings Inc., 3010 Woodhill road, plans the construction of a plant addition, 72 x 72 feet, to be a 3-story structure. Carter-Richards Co. is architect.

CLEVELAND—Wasmer Bolt & Nut Co. has been incorporated with 50 shares no par value stock by John C. Wasmer, 13826 Clifton boulevard.

CLEVELAND—Western Reserve Mfg. Co., 3710 East Ninety-third street, has awarded the general contract for a 1-story plant, 23 x 110 feet.

CLEVELAND—Briggs Mfg. Co., which closed its Cleveland plant about three years ago, will reopen the plant here about Nov. 1. Contracts for remodeling and interior rearrangement of the building on Taft avenue northeast, have been awarded Sam W. Emerson Co., the work to begin immediately.

COLUMBUS, O.—Armstrong Furnace Co., M. B. Armstrong, president, London, O., has awarded the general contract for a 1-story plant to be built here. (Noted Aug. 9.)

COLUMBUS, O.—City of Columbus, W. H. Duffy, Library building, contemplates the establishment of a municipal airport. The site is not decided upon definitely.

COLUMBUS, O.—A 3-story research laboratory will be erected on Eighth avenue at Summit street for Edward Orton Jr., 788 East Broad street. Miller & Reeves, 203 East Broad street, are architects.

COLUMBUS, O.—Columbus Aircraft Co., incorporated recently with $25,000 capital by A. J. Frame, president, contemplates the construction of an airplane manufacturing plant to employ 100 persons. The company plans to manufacture three types of airplanes. Production is now being effected in temporary quarters.

LOCKLAND, O.—Tennessee Copper & Chemical Co. has awarded the contract for structural steel for its new plant.

LORAIN, O.—Lorain Automatic Icer Co. has been incorporated with 10,000 shares no par value stock by H. J. Walker, G. A. Resek and Irven G. Roth.

PARKERSBURG, W. VA.—Spence Machine & Supply Co. has been incorporated with $50,000 capital by W. T. Elliott, 10 Camden place.

APPLETON, WIS.—The foundation for the new foundry of the Appleton Machine Co., South Oneida street, is complete. Workmen will start excavating for the casting pits soon. (Noted June 28).

Southern States

BIRMINGHAM, ALA.—United States Cast Iron Pipe & Foundry Co. has awarded the contract for structural steel for building additions to its pipe shops to Virginia Bridge & Iron Co.

CONWAY, ARK.—Bids have been received by the Conway City council for construction of a new power plant unit.

ORLANDO, FLA.—H. P. Leu Inc., 100 Livingston street, has received bids for the construction of a 2-story building, 83 x 100 feet, to include a machine shop.

MACON, GA.—Taylor Iron Works & Supply Co., 1014 Bradway, W. A. Taylor, president, plans to double the capacity of its plant and will build three buildings, including a foundry, pattern shop and boiler shop.

ENID, OKLA.—General Tool Co. is inquiring for machinery and equipment including lathes, punches and presses, for its proposed 1-story shop, 75 x 140 feet, to be built on Independence street.

GREENVILLE, S. C.—Hampton Smith, 506 McBee avenue, plans to organize a company to manufacture textile machinery and supplies.

CHATTANOOGA, TENN.—City of Chattanooga plans to vote on the establishment of an airport.

COOKEVILLE, TENN.—City of Cookeville, F. E. Collins superintendent, has taken bids on the construction of a power house in connection with a hydroelectric plant.

AUSTIN, TEX.—Plans are under way for rehabilitation of the municipal electric light and power plant. A new generating unit will be installed and the distributing system will be rehabilitated.

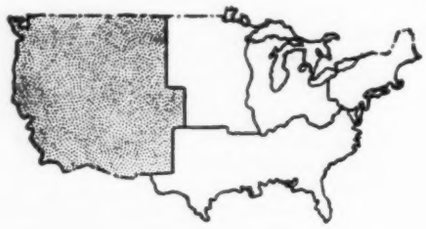
JACKSONVILLE, TEX.—Jacksonville Sheet Iron Works has been incorporated by Sam A. Cobb and C. W. Marshall.

LA FERIA, TEX.—City, L. H. Beddoes, mayor, contemplates establishing an airport here.

DANVILLE, VA.—Chamber of commerce has approved establishing an airport. When constructed it will have two runways, 500 feet long.

HAMPTON, VA.—Dixie Aircraft Corp., R. S. Skinner, president, Lynchburg, Va., has acquired a 65-acre tract of land near here and will construct an airplane assembly plant and airport, to include hangars and service station.

RICHMOND, VA.—Richmond Car Works, subsidiary of the Standard Steel Car Co., New York, is reported to have plans completed for doubling its capacity.



Western States

BENICIA, CALIF.—Yuba Mfg. Co., East Eighth street, plans to build a 1-story heavy forge shop, 70 x 100 feet.

EMERYVILLE, CALIF.—Fisher Body Corp., General Motors building, Detroit, plans to build a 1 and 2-story manufacturing plant here, on Park avenue.

HUNTINGTON PARK, CALIF.—Byron Jackson Pump Mfg. Co., 2150 East Slauson avenue, has awarded the general contract for the construction of its shop addition on East Slauson avenue. (Noted Sept. 27.)

LOS ANGELES—Hamilton Mfg. Co., Two Rivers, Wis., plans the construction of a plant and warehouse building for the manufacture of wood and metal newspaper printing and professional equipment at Central manufacturing district here.

SACRAMENTO, CALIF.—Pacific Gas & Electric Co., 245 Market street, plans the construction of a hydroelectric plant on Bear Creek, here.

SAN BERNARDINO, CALIF.—San Bernardino county water works plans to havte a vote on bonds for water works improvements, including drilling of wells, pumping plant construction, etc.

SAN FRANCISCO—Simmons Bed Co. has awarded a concrete reinforcing bar contract to Pacific Coast Steel Co.

SAN FRANCISCO—Bids will be taken on structural steel for the power plant for the Great Western Power Co., Indian Basin, San Francisco.

SAN FRANCISCO—Yuba River Power Co., 225 Bush street, plans power development at the north and middle forks of the Yuba river.

Construction will include a penstock and five power houses at Sierra City, Downieville, Ramshorn, Garden Valley and The Narrows.

TIBURON, CALIF.—Northwestern Pacific railroad, 64 Pine street, San Francisco, plans the construction of a 1-story shop here.

PORTLAND, OREG.—Marine Rotary Valve Motors Co. has leased quarters at 341 East Thirty-third street north, and will install equipment for the manufacture of marine and truck engines.

CENTRALIA, WASH.—Negotiations are under way for leasing of city owned land to George L. Barnes, who proposes to move his brass foundry from Everett, Wash., to this city.

West Central

CEDAR RAPIDS, IOWA—Central State Electric Co., John A. Reed general manager, plans power dam construction on the Des Moines river.

CHARLES CITY, IOWA—Iowa Public Service Co. has improved its generating plant and is planning now to install a new turbine. The plant will be the largest in northeastern Iowa.

ATCHISON, KANS.—Kansas Power & Light Co. plans the construction of a machine shop. Plans are private.

LAKIN, KANS.—Steps are being taken toward arrangements for the construction of a municipal light plant to be erected here.

NORTH WICHITA, KANS.—Work is now under way on the new steam power plant at the Missouri Pacific railroad property here. The new plant will be housed in an addition to the main Missouri Pacific shop building.

ST. LOUIS—Anheuser-Busch Inc., 721 Pestalozzi street, has awarded the general contract for a steam generating plant to consist of three boilers with superheaters, etc., to Ophuls & Hill Inc., 112 West Forty-second street, New York.

ST. LOUIS—Southern Equipment Co., 4607 South Broadway, August A. Muckler, president, has acquired the building at 5016 South Thirty-eighth street for manufacturing hotel, kitchen and restaurant equipment.

ST. LOUIS—Machinery is now being installed in the new building at Forest Park boulevard and Spring avenue, built for the Ramsay Accessories Mfg. Co. The present plants in St. Louis and Holland, Mich., will be combined in the new plant.

Canada

VANCOUVER, B. C.—Coast Iron & Metals Ltd., 422 Standard Bank building, has been incorporated with $10,000 capital.

HAMILTON, ONT.—Moncur Electric Construction Co. Ltd. has been incorporated to manufacture and deal in electric machinery and devices, with 400 shares no par value stock by James Moncur, George Moncur, and Thomas H. Crerar.

LONDON, ONT.—Paper Utilities Ltd. has been incorporated to manufacture and deal in gummed tape sealing machines, printing machines, lithographing machines, etc., with $50,000 capital by Esmond F. Howe, Arthur E. Cluff, Lillian Dell and others.

OTTAWA, ONT.—Atlas Electric & Supply Co. Ltd., has been incorporated to carry on the business of electrician, electrical and mechanical engineer, and manufacturer of engines, dynamos, generators, etc., with 500 shares no par value stock by Joseph C. Pinard, Emanuel Pinard, Samuel Bilsky, and others.

PORT BURWELL, ONT.—Kaufman Bros. is inquiring for complete equipment for a workshop, acetylene welding and battery service departments in connection with the rebuilding of a garage replacing a fire loss.

TORONTO, ONT.—McDougall Engineering Co. Ltd. has been incorporated with $10,000 capital by Sydney E. Wedd, Bruce V. McCrimmon, and John G. Middleton.

TORONTO, ONT.—McMasters-Jacob Engineering Co. Ltd. has been incorporated with $40,000 capital by Harold L. Steel, Joseph M. Bullen, and Gerald Murphy.

TORONTO, ONT.—Bage Supply Co. Ltd. has been incorporated to manufacture and deal in hardware with $40,000 capital by Stanley S. Mills, Richard D. Williams, and Vincent W. Price.

WINDSOR, ONT.—F. E. Dayus Ltd. has been incorporated to carry on the business of roofer, and sheet metal worker, with $30,000 capital and 10,000 shares no par stock by Frank E. Dayus, Bruce Williams and George M. Grant.

MONTREAL, QUE.—Cold Steam Blast Building Cleaning Co. Ltd. has been incorporated to manufacture and deal in merchandise and machinery, with $50,000 capital by Albert Marshall, Alexander MacKinnon, and Clarence L. Booth.

MONTREAL, QUE.—Southwestern Engineering Corp. of Canada Ltd. has been incorporated to carry on the business as civil and mechanical engineer with 5000 shares no par value stock by Alexander Chevalier, Roderick A. Kennedy and others.

New Trade Publications

STEEL CASTING—Farrell-Cheek Steel Foundry Co., Sandusky, O., has issued a number of bulletins indicating uses for one of its steel alloys, designed for strength, rigidity and toughness.

SANDS, CLAYS AND REFRACTORIES—Algernon Lewin Curtis, Chatteris, Eng., has recently published a folder listing the various sands, clays and refractories which he distributes.

GRAPHIC INSTRUMENTS—Esterline-Angus Co., Indianapolis, has issued a leaflet describing measures taken in the construction of its graphic instruments to insure satisfactory service to the purchaser.

PRODUCTION TOOLS—Apex Machine Co., Dayton, O., has issued a catalog of its quick change chucks, self-opening stationary and revolving die heads and universal joints. It is illustrated, and specifications for each tool are included.

ELECTRIC WELDER—General Electric Co., Schenectady, N. Y., describes in a current bulletin a type of automatic welding head and control with automatic electrode-feeding device and magnetic clutch. Details of construction are shown.

LANTERNS AND SANDERS—Nichols-Lintern Co., Cleveland, has issued a loose-leaf catalog, illustrated, presenting its various types of lanterns for use in industrial plants, and sanding devices for use on overhead cranes and locomotive cranes.

NICKEL STEEL—International Nickel Co., New York, has issued a bulletin on the use of nickel steel in airplane motors. Illustrations show various types of airplanes and charts indicate performance of motors. Motor parts made from nickel steel are also shown.

CONTRACTING EQUIPMENT—Sullivan Machinery Co., Chicago, is distributing a leaflet covering its equipment for contractors, featuring especially its air compressors. Tools to be used with the compressors are listed and illustrations show their application in service.

LUBRICATION—Lubrication of heavy duty engines and motor transport vehicle forms the subject of the current issue of the Texas Co.'s publication devoted to lubrication in general. Illustrations include numerous cross-sections of standard motors, showing how oil is applied to the various bearings.

DRY QUENCHING—Dry Quenching Equipment Corp., a subsidiary of the International Combustion Engineering Corp., in a current bulletin describes a newly-developed type of quencher designed for the use of small gas and coke works. It is simple in design and operation and low in cost.

LIGHT AND VENTILATION—A new folder has been issued by David Lupton's Sons Co., Philadelphia, illustrating and describing its methods of obtaining proper lighting and ventilation in foundries. The folder is illustrated with photographs of typical installations and sketches showing the theory underlying them.

GASOLINE LOCOMOTIVES—Mid-West Locomotive Works, Hamilton, O., has issued a catalog of its various types of gear-drive gasoline locomotives. Illustrations show the locomotives and details of their construction, drive, gearing and springs. A series of halftones shows the company's locomotives at work in various industries.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	58	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. Extra 5 per cent granted in the 4th quarter 1927 and 1st quarter 1928 discontinued April 2, 1928.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 3-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	.....

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh carload discounts. Less carloads 4 points less

STEEL (Lap Weld)

2 and 2¼-inch	27 off
2½ and 2¾-inch	37 off
3-inch	40 off
3¼ to 3¾-inch	42½ off
4 to 13-inch	46 off

(Note—Additional discounts of seven extra 5 per cents now being given on 21,000 pounds or more.)

CHARCOAL IRON

1½-inch	+18
1¾-inch	+ 8
2 and 2¼-inch	2 off
2½ to 3-inch	7 off
3¼ to 4½-inch	9 off

(Note—Additional discounts of two 10's and one 2½ now being given on 12,000 pounds or more.)

SEAMLESS COLD DRAWN

1-inch	53 off
1¼ and 1½-inch	55 off
1¾-inch	39 off
2 and 2¼-inch	34 off
2½ and 2¾-inch	42 off
3-inch	48 off
3¼ and 3½-inch	50 off
4-inch	53 off
4½, 5 and 6-inch	45 off

SEAMLESS HOT ROLLED

2 and 2½-inch	40 off
2½ and 2¾-inch	48 off
3-inch	52 off
3¼ and 3½-inch	56 off
4-inch	59 off
4½, 5 and 6-inch	48 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.30 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates Not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot ..... .20c

Plates Over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c

Hull materials subject to U. S. Navy Dept. specifications for medium or soft steel ..... .10c

High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications 1.00c

Boiler steel subject to U. S. Navy Dept. specifications, classes A and B 1.50c

Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet.....No extra

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with reentrant angles)

Additional extra ..... .20c

Model 24-P ejection type press, having box 100" long, 20" wide, 42" deep. Finished bales measure 20" x 14" x 14" minimum Can be equipped with power operated loading hopper.

LOGEMANN SCRAP METAL PRESSES

Hydraulically compressed scrap commands at all times the *best price,* and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.

***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.

PIONEERS!

LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metal-working establishments of all kinds.

Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.

LOGEMANN BROTHERS COMPANY, 3126 Burleigh St., MILWAUKEE, WIS.

European Iron and Steel Statistics

Gross Tons

Pig Iron Production

Monthly Average	United Kingdom	France	Belgium	Luxemburg	Germany*
1912	729,000	405,000	192,000	184,800	1,279,200
1913	855,000	427,200	203,800	209,000	1,374,400
1921	218,000	280,300	71,800	79,600	643,200
1922	408,500	428,900	132,300	138,200	770,500
1923	620,000	445,600	179,100	115,400	404,700
1924	609,000	631,100	230,300	177,000	640,500
1925	521,800	696,800	208,500	192,300	834,500
1926	203,500	770,500	278,800	206,100	791,000
1927					
January	434,600	792,400	311,500	224,100	1,044,600
February	571,100	705,100	288,000	204,500	953,600
March	671,800	788,500	309,400	226,200	1,068,900
April	680,000	761,800	305,100	221,000	1,035,400
May	720,100	781,800	314,000	233,900	1,112,100
June	651,300	735,000	297,300	220,300	1,050,900
July	645,800	757,100	314,700	221,700	1,091,600
August	596,100	761,400	311,700	234,500	1,098,100
September	591,500	749,500	304,000	225,500	1,087,400
October	596,300	782,600	317,200	226,600	1,121,600
November	575,900	750,100	308,200	217,800	1,101,900
December	559,100	783,600	311,900	224,600	1,131,700
1928					
January	560,500	796,400	309,700	226,000	1,162,100
February	550,800	772,100	297,300	216,700	1,104,800
March	592,600	845,000	321,400	236,500	1,152,200
April	563,100	821,100	313,220	223,400	1,029,100
May	591,500	857,400	323,700	230,200	1,027,700
June	563,700	830,800	316,000	226,900	1,005,400
July	537,800	.....	.....	.....	1,018,500

Ingots and Castings Production

Monthly Average	United Kingdom	France	Belgium	Luxemburg	Germany*
1912	566,000	363,000	206,000	79,400	1,339,600
1913	638,600	384,500	202,300	109,000	1,445,700
1921	308,600	254,500	62,800	61,900	819,700
1922	490,100	372,000	128,400	114,300	960,500
1923	706,800	419,100	186,200	98,300	517,000
1924	685,100	566,000	234,700	154,300	806,500
1925	615,500	608,300	197,700	170,800	1,000,000
1926	296,700	687,900	276,800	184,100	1,012,500
1927					
January	730,700	662,900	315,700	192,300	1,288,500
February	826,800	618,200	292,200	181,300	1,214,300
March	949,600	692,900	309,700	199,800	1,393,600
April	850,100	669,900	296,400	202,800	1,269,100
May	884,600	700,800	316,100	206,900	1,356,200
June	747,300	661,400	295,100	200,000	1,307,200
July	687,100	666,300	309,200	199,800	1,341,100
August	643,100	683,200	320,600	212,500	1,409,700
September	777,000	682,400	285,400	209,600	1,353,600
October	699,000	711,600	307,200	211,800	1,392,300
November	698,700	671,300	305,200	204,200	1,380,000
December	604,900	723,500	305,900	210,500	1,351,100
1928					
January	626,200	738,300	310,700	209,600	1,446,500
February	764,400	726,500	305,600	201,800	1,301,300
March	793,300	791,400	321,600	216,900	1,398,200
April	644,100	726,500	300,300	199,400	1,143,300
May	752,700	781,600	320,100	211,400	1,228,300
June	709,000	784,600	323,800	211,600	1,274,300
July	666,900	.....	.....	.....	1,290,600

*German pre-war boundaries for 1912 and 1913; from 1919 the figures do not include the Saar district returns.

Imports

	United Kingdom	Belgium and† France	Luxemburg	Germany*
Average monthly 1912	166,400	16,400	87,000	27,300
Average monthly 1913	185,900	14,100	72,900	25,000
Average monthly 1921	136,700	41,300	43,300	54,000
Average monthly 1922	73,500	63,300	47,700	152,300
Average monthly 1923	110,200	58,500	43,700	145,000
Average monthly 1924	202,400	57,100	46,800	160,000
Average monthly 1925	226,700	14,100	44,500	98,400
Average monthly 1926	311,700	14,200	50,200	86,500
1927				
January	555,500	7,900	45,800	129,500
February	443,400	10,100	36,800	143,400
March	478,100	10,500	54,000	129,800
April	404,700	12,000	47,300	200,000
May	355,900	15,100	47,500	186,400
June	332,600	14,100	56,300	186,300
July	336,300	12,000	52,700	189,000
August	286,300	9,900	63,400	211,300
September	312,000	6,900	50,000	210,900
October	336,000	8,100	68,000	232,800
November	284,800	8,200	57,800	223,900
December	280,500	11,400	59,800	190,100
1928				
January	283,900	6,000	65,000	200,800
February	286,900	10,100	72,000	179,600
March	271,500	16,800	70,200	187,700
April	252,700	10,000	61,700	189,100
May	236,900	.....	63,800	164,800
June	210,400	.....	74,200	162,200
July	219,000	.....	.....	.....

*Luxemburg is ncluded with Germany in 1912 and 1913.

Exports

	United Kingdom	Belgium and† France	Luxemburg	Germany*
Average monthly 1912	400,600	41,500	124,500	482,400
Average monthly 1913	414,100	51,600	129,200	517,300
Average monthly 1921	141,400	133,800	75,600	160,000
Average monthly 1922	283,400	161,400	175,900	209,700
Average monthly 1923	360,000	181,900	207,900	110,000
Average monthly 1924	321,100	231,100	282,200	130,000
Average monthly 1925	310,900	321,700	262,800	267,600
Average monthly 1926	249,000	343,800	308,900	402,000
1927				
January	219,400	463,300	345,900	478,400
February	251,700	480,600	364,500	352,900
March	353,000	472,700	415,000	374,100
April	334,500	519,100	383,800	344,300
May	422,400	461,900	364,800	344,300
June	366,100	432,900	351,300	307,600
July	389,600	454,600	375,700	340,600
August	342,400	465,800	426,700	333,200
September	384,900	453,600	357,100	346,800
October	384,800	508,400	372,900	340,700
November	399,100	449,300	392,900	326,800
December	381,800	440,300	456,300	340,600
1928				
January	332,200	408,100	274,600	363,026
February	317,000	462,700	395,500	390,776
March	409,300	443,500	453,100	334,798
April	344,300	398,800	323,600	412,810
May	359,000	390,800	332,700	378,500
June	365,900	.....	375,100	420,500
July	333,100	.....	.....	.....

†Luxemburg included with Belgium from 1922 onward.

American Iron and Steel Exports, Imports

Gross Tons

	Imports	Exports
1928		
January	58,635	205,766
February	47,628	185,915
March	74,128	221,935
April	72,329	215,184
May	72,106	267,890
June	65,819	262,052
July	47,830	253,336
1927		
January	63,404	215,235
February	49,451	166,128
March	61,872	171,094
April	60,374	192,339
May	79,814	202,708
June	69,017	184,364
July	61,112	190,502
August	68,386	175,636
September	58,464	166,352
October	52,503	170,255
November	61,882	177,928
December	64,188	168,428
Total	750,467	2,180,969
1926		
January	79,067	174,585
February	100,213	157,187
March	93,107	169,438
April	107,636	194,449
May	108,731	173,418
June	124,215	159,506
July	82,411	194,717
August	91,578	171,588
September	85,484	182,071
October	81,830	172,070
November	81,259	219,830
December	75,559	198,189
Total	1,111,090	2,167,048
1925		
January	77,065	141,714
February	92,380	102,302
March	92,110	155,386
April	71,249	155,426
May	68,117	150,612
June	83,330	136,847
July	64,642	138,670
August	68,489	188,963
September	68,445	136,754
October	80,163	141,817
November	79,771	171,134
December	98,400	142,209
Total	943,240	1,762,571

Yearly Totals		
1924	556,281	1,805,064
1923	734,734	2,009,141
1922	712,895	2,005,100
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,301	6,465,055
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635
1912	225,072	2,947,596
1911	262,457	2,187,725
1910	510,730	1,537,943
1909	363,984	1,243,583
1908	205,845	964,242
1907	662,358	1,501,981
1906	577,809	1,325,740
1905	416,000	1,011,255
1904	266,398	1,167,674
1903	1,178,797	326,590
1902	1,212,484	1,103,664
1901	221,297	700,852
1900	209,955	1,154,284